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Integration quality dynamics in multichannel services marketing

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INTEGRATION QUALITY DYNAMICS IN MULTICHANNEL SERVICES MARKETING

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Abstract

In recent years, channel proliferation is taking place due to the advent of Information Communication Technology (ICT). In addition to the traditional physical stores, companies are developing interactive websites, engaging mobile apps, digital kiosks, and many other technologically advanced channels to provide service. However, if companies do not integrate all these channels to deliver a connected and seamless experience, they risk declining customer satisfaction and equity. To address this issue, the present study aims to answer the research question: *What factors influence multichannel integration quality (MCIQ) and what are the impacts of integration quality on service outcomes*?

To explore the dimensions and outcomes of integration quality in multichannel services, this research used a systematic literature review and qualitative data analysis of two focus group discussions and twenty in-depth interviews. Furthermore, this research used 301 online survey questionnaires from multichannel banking customers to provide statistical evidence of dimensions and outcomes of MCIQ. PLS path modelling was used to test hypothesised relations and validate the hierarchical MCIQ model and its effects on outcome constructs.

The findings from PLS-SEM analysis empirically evidenced four essential dimensions (channel-service configuration, content consistency, process consistency, assurance quality) and ten sub-dimensions (breadth of channel choice, transparency of channels, appropriateness of channels, information consistency, transaction data integration, system consistency, image consistency, privacy, security and service recovery accessibility) of MCIQ. The results prove MCIQ affects three drivers of customer equity (brand equity, value equity, and relationship equity), while multichannel satisfaction acts as a partial mediator between MCIQ and customer equity.

From a theoretical point of view, until now, literature on service quality has predominantly focused on a single-channel mindset where quality has been conceptualised from either a physical or virtual environment perspective. However, integration quality, which is the central theme of multichannel success for organisations, remained underexplored. This research provides a scholarly contribution by first, offering a multidimensional and hierarchical model of MCIQ. This research extends the existing service quality theory by conceptualising and empirically evidencing dimensions and sub-dimensions of MCIQ and offers several new dimensions and subdimensions of MCIQ (i.e., assurance quality and its sub-dimensions privacy, security and service recovery accessibility; and sub-dimensions of process consistency, i.e., system consistency and image consistency) which were not conceptualised in multichannel service quality literature before. Second, this research extends current knowledge of MCIQ by addressing a novel service outcome, i.e., customer equity (CUEQ), and its drivers brand equity, value equity, and relationship equity. Third, this research evidenced multichannel satisfaction (MSAT) as a partial mediator between MCIQ and CUEQ. Finally, the model of MCIQ comprising of its dimensions, outcomes and moderators has been tested quantitatively to confirm its validity.

The findings of this research will provide managers with valuable guidelines for creating a blueprint of service management processes. It will help managers to understand the role of integration within services marketing channels, the impact of integration on service quality perception and the importance of customer involvement in multichannel services. From an academic point of view, this research fills the existing knowledge gap in the area of integration quality and multichannel services marketing by developing and empirically validating the components of MCIQ and its overall impact on customer satisfaction and equity.

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Hossain, TMT, Akter, S., Kattiyapornpong, U. and Dwivedi, Y.K., (2019). Multichannel integration quality: A systematic review and agenda for future research. *Journal of Retailing and Consumer Services*, *49*, pp.154-163.

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Hossain, TMT, Akter, S. & Kattiyapornpong, U. (2017), 'Moderating Role of Customer Engagement within Omnichannel Marketing', Paper presented at the *Australia & New Zealand Marketing Academy (ANZMAC) 2017*, Melbourne, Australia.

Hossain, TMT, Akter, S., & Kattiyapornpong, U. (2017). The Moderating Impact of Customer Involvement on Multichannel Quality, Satisfaction and Equity. Paper presented at the *Academy of Marketing Conference 2017*, Hull, UK.

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Certification

I, Tasnim M Taufique Hossain declare that this thesis submitted in fulfilment of the requirements for the conferral of the degree Doctor of Philosophy, from the University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. This document has not been submitted for qualifications at any other academic institution.

Tasnim M Taufique Hossain
16th November 2020

List of Names or Abbreviations

MCS: Multichannel services

MCIQ: Multichannel integration quality

CSCO: Channel-service configuration

CONC: Content consistency

PROC: Process consistency

ASNQ: Assurance quality

MSAT: Multichannel satisfaction

CUEQ: Customer equity

SEM: Structural equation modelling

PLS: Partial least squares

ICT: Information communication technology

CBA: Commonwealth Bank of Australia

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Chapter 1: Introduction[1]

1.1 Research Background

> *"There was a time when the online and offline businesses were viewed as being different. Now we realise that we have a physical advantage, thanks to our thousands of stores, and we can use it to become Number 1 online."* - Raul Vasquez, Walmart.com Chief Executive (Bustillo & Fowler 2009).

Customers have seen a growing trend towards multichannel services in the last two decades. Due to the growth of Information and Communication Technologies (ICT), retailers now utilise numerous channels through which customers can avail similar offerings (Forrester Inc 2014). More recently, the advent of online channels and ongoing digitisation have shifted marketing landscape to a new phase of multichannel services (Leeflang et al. 2014; Rigby 2011; Verhoef et al. 2015). This is causing fundamental changes in both traditional marketing practices (Webb 2002) and customers behaviours (Dholakia et al. 2010). Firms must keep up with the changing environment and operate in a multichannel approach through effective evaluation and incorporation of the new channels.

[1] An abridged version of the entire dissertation is encapsulated in this chapter, which was published in the following journal:

Hossain, TMT, Akter, S, Kattiyapornpong, U & Dwivedi, Y (2020), 'Reconceptualizing Integration Quality Dynamics for Omnichannel Marketing', *Industrial Marketing Management*, *87*, pp. 225-41.

1.1.1 Multichannel Management

Multichannel management is one of the most crucial aspects of channel strategies throughout the world now. The plethora of channels these days range from physical channels (e.g., retail stores, hotel reception) to technology-assisted channels (e.g., self-service kiosks, interactive voice response (IVR) service), to virtual channels (e.g., internet, mobile apps, social media marketplace). Nowadays, in addition to the traditional physical stores and websites, customers leverage a variety of new digital channels through mobile phone channels, tablets, direct marketing, social media sites/platforms, telemarketing, location-based marketing, mobile apps and many other channels to fulfil their objectives. In 2016, 49% of total US retail sales were through digital touchpoints (Forrester Research 2018). In the UK, there is an increasing trend of using mobile phones in physical stores to check and compare prices with an online-only retailer and ultimately purchasing through those online retailers (Forrester Research 2019). Across Australia, Japan, India, and South Korea, research indicates that 55.8% sales in 2018 have taken place through channels other than physical outlets (Forrester Research 2019).

This proliferation of channels has created challenges for both managers and academics whereas the former seek resources to manage this dynamic environment efficiently and the latter produce insights to conceptualise and address customer perception related to multichannel services (Neslin et al. 2006). Many companies have risen to the challenge of channel and device proliferation by developing useful mobile apps, creating engaging websites and making the physical stores well-organised. However, companies risk being exposed to increased operational cost and frustrated customers if they do not provide a connected and continued experience by integrating all these channels (Accenture 2013). For example, a customer review regarding a popular bank in Australia revealed the following: "*I have spoken to ten people and been given ten different answers and am still*

no closer to resolving my loan issues. Information on their website does not match with what they say. Absolute disgrace!" (Product Review 2015). Clearly, there is inconsistency within channels in perceived service quality.

Satisfying and managing today's consumer expectations of seamless, consistent and personalised shopping experiences require integration of all the service delivery channels of a firm (Brynjolfsson et al. 2013; Rigby 2011). Most companies delivering multichannel services use a siloed system where they operate physical and online channels separately (Herhausen et al. 2015; Rigby 2011). Research indicates that customer satisfaction is a result of customer experience not only of a single channel rather a combination of online and offline services provided through different channels (Banerjee 2014; Montoya-Weiss et al. 2003; Sousa & Voss 2006). The success of multichannel services does not depend on how many channels a company offers, rather on the level of synergy within physical and virtual channels (Banerjee 2014; Herhausen et al. 2015; Sousa & Voss 2006; Wu & Chang 2016). Customers evaluate channel quality by combining their experience of using all the channels they used to avail that service (Montoya-Weiss et al. 2003; Sousa & Voss 2006). If service delivery channels of a company are not adequately integrated to provide a seamlessly connected and continued experience, companies risk being exposed to increased operational cost and frustrated customers (Picot-Coupey et al. 2016).

1.1.2 Channel Silos

Managing channels in silos have resulted in losing customers to competition due to customer dissatisfaction (Piotrowicz & Cuthbertson 2014). Siloed approach is no longer appropriate as customers frequently use more than one channel these days. A recent study reports that organisational silos are still the most significant barriers in creating a customer-centric business (Harvard Business Review Analytic Services 2018). For

example, H&M reported a loss of its share price in late 2017, which was mainly because of the lack of online-offline integration and customer dissatisfaction resulting from inconsistent information between channels (Sharma 2017). Other retailers such as Debenham, and Marks and Spencer announced store closure due to being unable to change store portfolio (O'Grady et al. 2018). Australia's leading grocery retailer, Coles, is yet to integrate price with its website, mobile app, and in-store (Hatch 2016). Furthermore, customer-centric challenges such as recognising shoppers and their unique profile and being able to curate product or services according to individual shopper needs remain one of the biggest challenges for multichannel firms (Reyhle 2017). Hence, integration of physical and virtual channels is the key to the enhanced customer experience (Rizzi & Taraporevala 2019).

Even from a theoretical standpoint, service quality research has primarily focused on a single channel perspective (Banerjee 2014; Sousa & Voss 2006). The extant literature often used a siloed approach in this stream by viewing offline and online channels separately (Herhausen et al. 2015; Huré et al. 2017). Researches on service quality have taken place from either physical channel (Grönroos 1984; Parasuraman et al. 1985; Rust & Oliver 1994) or virtual channel perspective (Aladwani & Palvia 2002; Barnes & Vidgen 2002; Loiacono et al. 2000; Parasuraman et al. 2005; Wolfinbarger & Gilly 2001; Yoo & Donthu 2001).

1.1.3 Multichannel Integration Quality

To address both offline and online channel as a whole, a renewed conceptualisation of multichannel service quality is required. Sousa and Voss (2006) have coined the term for this phenomenon as *multichannel integration quality* (MCIQ) and have proposed conceptual dimensions of integration quality. Several studies suggest multichannel

integration quality (i.e., consistency of service elements, aligning channels and its attributes under one umbrella) as a crucial aspect to provide seamless service experience (Banerjee 2014; Falk et al. 2007; Ganesh 2004; Johnston & Clark 2001; Montoya-Weiss et al. 2003; Patrício et al. 2008; Sousa & Voss 2006). Integrated/seamless experience of using various channels is one of the vital foundations of multichannel management (Huré et al. 2017; Lee et al. 2018; Li et al. 2018; Shen et al. 2018; Verhoef et al. 2015). Reports on multichannel integration show implementing an integrated multichannel system result in 250% higher purchase frequency, 13% more order value, 90% higher customer retention and 13.5% more engagement rate compared to a single-channel system (Collins 2019). At Myer, one of Australia's largest department stores, channel integration resulted in a 41.1% increase in online sales in 2017 (Cameron 2017).

1.1.4 Research Scope and Gaps in Literature

Despite its importance, research related to MCIQ remains mostly fragmented and conceptual. There is a paucity of research that provides a general taxonomy from which to explore dimensions and applications of MCIQ and their effects on firms (Banerjee 2014; Trenz 2015). Besides, research on integration quality is still at a conceptual level. Although most customer use multiple channels to avail services and organisations face a challenge to deliver seamless experience within channels (Banerjee 2014), most studies on integration quality are focused on conceptualising the term (i.e. Neslin et al. 2006; Sousa & Voss 2006). Only a few studies have conceptualised and tested dimensions of integration quality (Hsieh et al. 2012; Lee et al. 2018; Oh & Teo 2010; Shen et al. 2018; Wu & Chang 2016). The findings of these studies make it apparent that there remains scope for developing and validating an integration quality model in the context of multichannel services. There is a lack of research that addresses factors influencing MCIQ, i.e., whether it will result in better channel performance or not and what impact it

will have on consumer perception of service quality (Accenture 2013; Verhoef et al. 2015).

As literature related to MCIQ is still quite fragmented and there is a paucity of research conceptualising dimensions of MCIQ, a renewed conceptualisation and empirical evidence of integration quality, its dimensions and its consequences are required for the field of service quality research in the multichannel environment. This study proposes to fulfil these gaps.

Apart from quality dimensions, service quality literature has focused on different constructs impacting consumer perception. A fruitful avenue for further research in integration quality is to measure consumer perception of integration quality (Banerjee 2014). Several articles have discussed different behavioural outcomes due to the integration of channels. Integration quality leads to perceived value (Oh & Teo 2010; Wu & Chang 2016), purchase intention (Herhausen et al. 2015; Wu & Chang 2016), sales growth (Cao & Li 2015), overall satisfaction (Hammerschmidt et al. 2015), search intentions (Herhausen et al. 2015), and loyalty (Schramm-Klein et al. 2011). Although satisfaction and customer equity have been indicated as essential outcomes of service quality, within multichannel literature, the impact of channel integration on satisfaction and customer equity has received little or no attention. The underlying unanswered question in this issue is related to the service outcomes that are influenced by the integration of channels within an organisation.

In addition to the theoretical perspective, managers also face considerable challenges due to the lack of in-depth knowledge of integrated service quality perceptions related to multichannel services. For instance, an example provided by Banerjee (2014) indicates, managers might be tempted to increase the number of channels to provide their services

through different touchpoints. However, research indicates that from a customer's perspective, not all channels are appropriate for all services (Banerjee 2014; Hossain et al. 2019). For example, banking customer may perceive call centres as an inappropriate channel to sell bank loans, as call centres may not be prepared to answer technical questions related to the loan product (Banerjee 2014). Furthermore, research indicates that when there are any inconsistencies amongst the channels, it may cause customer dissatisfaction (Lee et al. 2018; Li et al. 2018; Seck & Philippe 2013; Sousa & Voss 2006). For example, if banking transaction made in a physical store is not properly reflected in all the other channels such as website and mobile app or if there is inconsistency in information within these channels, customers face stress and disappointment (Hossain et al. 2019).

Hence, using multichannel services without the proper knowledge of changing consumer behaviour may distance the consumer from the brand rather than engaging them.

Table 1-1 Key research gaps that motivate the need for the study

Limitation/motivation/research theme	Supporting literature
Dimensions of channel integration MCIQ Literature highlights several reasons to conceptualise dimensions and explore new dimensions of channel integration in the multichannel context	"Empirical work is needed to develop measurement instruments for virtual, physical, and integration quality based on the respective proposed construct domains". (Sousa & Voss 2006, p. 369). "The next research step would be to generate scale items for a research instrument. A fruitful research avenue would be to measure consumer and organizational perceptions of integration quality and identify differences and/or similarities between the two perspectives." – (Banerjee 2014, p. 471). "Researchers can also further identify additional dimensions of service quality that are specific to this unique context and examine the importance of different dimensions" (Wang, T et al. 2016, p. 654). "There might be alternative variables affecting customer engagement … resulted from the channel integration quality. Future studies should incorporate those

	potential variables into the research model for yielding a rigorous interpretation of the effects of channel integration quality…" (Lee et al. 2018, p. 98). "We cannot deny the existence of other factors that may potentially shape customers' reaction to cross-channel integration. Future investigations could hence expand the scope of our study by exploring … other pertinent factors" (Li et al. 2018, p. 57)
Effects of channel integration on behavioural outcome: Several scholars highlight the necessity of modelling the impact of channel integration on various service quality perceptions.	"Another approach may involve investigating the effects of different types of expectations on service quality perceptions and behavioural intentions." (Wang, T et al. 2016, p. 654) "Future research could also focus on channel performance measurement by using the methods mentioned above to find out the effect on different consumer behavioural aspects. Research on consumer behavioural aspects such as loyalty, satisfaction, cross-buying, customer engagement, customer lifetime value, and consumer equity can be conducted to understand how these are influenced by channel integration." (Hossain et al. 2019, p. 161).
Adding more channels in the research: Few studies stressed the importance of adding more channel in the research analysis to get a better idea about channel integration.	"With the expected future profusion of new virtual channels of service delivery (e.g., mobile devices), future research will need to address the impact of these new channels on the nature of virtual, physical, and integration quality and reflect on the new integration challenges raised by these channels." (Sousa & Voss 2006, p. 362). "While we have incorporated the main channels (e.g., online, offline and mobile devices) fundamental to CCI, we cannot claim to have captured the panorama of omnichannel retailing. Future studies could extend the channel scope by adding customer touchpoint that can enrich consumers' shopping experience and overall satisfaction." (Li et al. 2018, p. 57).
Other factors related to channel integration: Several other factors pertaining to channel integration have been highlighted in different studies such as multidimensionality, different product categories, different economies and so on.	"Future research should attempt to replicate the study on a wider sample of hybrid stores across different product categories and countries to revalidate the structural model results. Analyses across product categories and cross-countries comparisons would definitely add interesting insights to the understanding of this research topic." (Oh & Teo 2010, p. 54) "The scales to measure information quality and service convenience represent parsimonious measurements in the context of hybrid commerce. Subsequent research should attempt to delve into the multidimensional aspects of these constructs." (Oh & Teo 2010, p. 54)

	"Future research could also investigate the different degrees of customer involvement and input in information generation and its impact on integration quality in multichannel services (e.g., health care services in which patients have limited or no input in information generation vs. travel services with large amounts of customer input)." (Banerjee 2014, p. 471). "Our findings may be specific to this research setting, though our broad conceptual framework suggests a means to generalize our hypotheses to other settings. Replications of our study in other economies would be welcomed." (Cao & Li 2015, p. 214). "Mapping MCIQ dimensions on customer experience and customer journey stages (Lemon and Verhoef, 2016) with empirical evidence can be a fruitful research avenue to extend existing MCIQ literature" (Hossain et al. 2019, p. 161).

Based on these perspectives, this research proposes to answer the following research questions:

RQ1: What are the dimensions of multichannel integration quality in services marketing?

RQ2: What is the impact of multichannel integration quality on service outcomes (i.e., multichannel satisfaction, customer equity)?

1.2 Research Contributions

There are several areas where this study makes original, theoretical and practical contributions to multichannel service quality research. First, using integration quality concept, this research conceptualises and empirically test the dimensions and sub-dimensions of MCIQ, which address the research call by Sousa and Voss (2006), Banerjee (2014), Hossain et al. (2019). Banerjee (2014) used qualitative research to conceptualise the dimensions of integration quality proposed by Sousa and Voss (2006). Still, the dimensions are yet to be tested and the causal relationship yet to be modelled in empirical studies. This research conceptualises the dimensions of integration quality by applying both qualitative and quantitative methods to test a model of integration quality

empirically. The qualitative part builds on the findings of the thematic analysis. It helped to extend the limited knowledge of multichannel integration quality by confirming the existing dimensions of MCIQ which are identified in the literature review. The qualitative part further helped to identify new dimensions of MCIQ. The quantitative part was used to establish a comprehensive understanding of the dimensions of MCIQ and its impact on perceived service outcomes. It provided empirical evidences of the dimensions of MCIQ and established a causal relationship between the dimensions and outcome variables.

Second, this research develops a hierarchical integration quality model for multichannel services, which extends the current research by adding several new dimensions and provides empirical evidence for conceptual dimensions as proposed by Sousa and Voss (2006), Neslin et al. (2006), Oh and Teo (2010), Banerjee (2014), Wu and Chang (2016) and Shen et al. (2018).

Third, this research examines the outcomes of integration quality on consumer satisfaction and customer equity. Furthermore, it assesses the behavioural impacts of MCIQ on service outcomes by linking multichannel satisfaction and customer equity to address the high priority research call by Rust et al. (2004) and Wang, H et al. (2016). In doing so, this research evidences significant influence in fulfilling the knowledge gap of integration quality in multichannel service marketing and provides managers with precise information about how to address issues related to multichannel service marketing.

Finally, most researches on MCIQ only focus on the phenomenon from the lens of only two channels, i.e., physical and website (e.g., Hsieh et al. 2012; Lee et al. 2018; Li et al. 2018; Oh & Teo 2010; Seck & Philippe 2013). This research addresses MCIQ focusing

on three specific channels, i.e., physical, web, and mobile, which is aligned with the current customer trend.

From a practical perspective, the findings of this research provide managers with valuable guidelines for creating a blueprint of service management processes. Findings of this research enable managers to understand the role of integration within marketing channels. Identification of factors which influence integration quality allows managers to allocate resources in those areas and a greater understanding of areas for successful multichannel design. This research also provides valuable insights regarding integration quality and its impact on consumers' service quality perception. This research evidences customer equity and multichannel satisfaction as outcomes of integration quality. Increased attention in these areas will help managers to deal with complex multichannel service situations. Using the knowledge of this research, managers will be able to identify ways to involve customers with their channels and in that process create a successful multichannel service within the organisation (see Chapter 8 for detailed contributions).

1.3 Structure of the Thesis

This dissertation consists of eight chapters. A brief overview of all the chapters of this dissertation is discussed in the following sections:

1.3.1 Chapter 1: Introduction

The study starts with an introductory chapter (the present chapter) which provides the motivation and the significance of the research, highlights the focus and the scope of this study and discusses the research objective and question. This chapter further provides an overview of the study approach, contribution and describes the thesis framework.

1.3.2 Chapter 2: Literature Review (Multichannel Service Quality)

Chapter 2 provides the necessary background about MCIQ and assesses the state of current MCIQ research. First, this chapter provides a general overview of service quality concepts, including service quality from single-channel perspective. Second, the chapter presents an overview of MCIQ in terms of its definitions and dimensions. Third, this chapter reviews the behavioural outcomes due to MCIQ. Finally, this chapter discusses the research gaps in the literature.

1.3.3 Chapter 3: Exploratory Analysis

Chapter 3 presents the exploratory analysis through a systematic literature review and qualitative analysis to conceptualise dimensions of MCIQ. The chapter presents the method used for thematic analysis and qualitative analysis, the sampling plan for qualitative analysis, data-collection methods, and results. This exploratory study aims at examining the factors influencing multichannel integration quality.

1.3.4 Chapter 4: Conceptual Framework and Hypotheses Development

Chapter 4 aims to build a multichannel integration quality (MCIQ) model centred on the research findings and gaps found and synthesised in Chapter 2 (Literature Review) and Chapter 3 (Exploratory Research). This chapter strives to conceptualise the dimensions and subdimensions of MCIQ and to measure its overall impact on satisfaction and customer equity. The research hypotheses are presented in this chapter.

1.3.5 Chapter 5: Research Design and Methodology

Chapter 5 describes the methodological considerations used to conduct the study. The chapter begins by introducing the positivist research paradigm, the use of the quantitative method and web survey, followed by explaining the procedure for sampling and collating

the research data. The chapter then describes the statistical methods which have been used to validate and evaluate the data and calculate the parameters of the research model.

1.3.6 Chapter 6: Research Methodology – Instrument Development

Chapter 6 argues that there is a paucity of valid and reliable instruments for adequately capturing MCIQ. Current interest in multichannel integration quality has led to the development of scales for a few constructs. However, it is clear from the literature review that there is a scope of preparing a valid and reliable instrument for new dimensions to capture the entirety of multichannel integration quality. Thus, the central thesis of this chapter is to develop and validate an instrument to measure multichannel integration quality within the field of service quality research.

1.3.7 Chapter 7: Data Analysis and Results (Main Study)

Chapter 7 is intended to address the empirical results of the study. The study applies PLS path modelling in estimating the third-order formative-reflective MCIQ model. The study argues that PLS leads to more theoretical rationality and less complex model for estimating a higher-order model. This chapter provides findings on the PLS assessment, specifically the structural model, measurement model and extended model with mediating effects, and the effects of control variables.

1.3.8 Chapter 8: Discussion and Conclusions

Chapter 8 presents the empirical findings of the study, outlines the answers to the research questions and discusses the research hypotheses. It illustrates significant contributions and implications of the study for both theory and practice. The chapter also discusses the limitations of the study and future research directions and ends with concluding thoughts.

1.4 Summary

This chapter provided an overview of the present study. The chapter initially discussed the research problem, rationale and objectives, which was followed by the specification of the research questions in the context of MCIQ. The chapter also highlighted the contributions of the study concerning theory and practice. Finally, the chapter presented the structure of the thesis by briefly outlining the eight chapters in the dissertation. The next chapter reviews the literature and synthesises the findings and gaps in MCIQ.

Chapter 2: Literature Review[2]

2.1 Overview

This chapter seeks to explore service quality theories and review the literature on multichannel integration quality. Quality dynamics or antecedents and consequences of service quality play an essential role in a customer's perception of multichannel services. Hence, this chapter concentrates on the service quality concept within service delivery channels and further delves into the integration quality concept. Analysis of literature leads to the identification of significant gaps within multichannel service quality literature, which is discussed at the end of this chapter. Furthermore, the literature review of service quality perceptions due to multichannel integration leads to the identification of several behavioural outcomes. Identification of gaps within this context leads to the suggestion of new behavioural outcomes.

The chapter is designed according to the following pattern: Section 2.1.1 defines multichannel services. Section 2.1.2 and 2.1.3 provide the definition of quality and service quality. Section 2.2 discusses generic service quality models within physical and virtual settings. Section 2.3 discusses multichannel service quality and defines the notion of multichannel integration quality (MCIQ). Furthermore, this section delves into the dimensions of MCIQ as discussed in various multichannel studies. Section 2.4 moves

[2] An abridged version of this chapter was published in the following journal:

Hossain, T.M.T., Akter, S., Kattiyapornpong, U. and Dwivedi, Y.K., (2019). Multichannel integration quality: A systematic review and agenda for future research. Journal of Retailing and Consumer Services, 49, pp.154-163.

towards identifying service quality perception on multichannel service quality. This section also discusses the gaps within the context of service quality perception and puts forward possible outcomes of MCIQ by providing definition and relation with service quality. Section 2.5 presents a specific issue within channel integration, i.e., omnichannel management. This section defines omnichannel management and shows the similarity and difference of omnichannel with MCIQ. Finally, all these analyses lead to the identification of different gaps within multichannel service quality literature. Section 2.6 discusses these gaps in the literature by critically examining studies related to MCIQ.

2.1.1 Defining Multichannel Services

To define multichannel services, first, the understanding of marketing channels is required. A marketing channel is defined as *"a business structure, reaching from the point of product origin to the consumer, through which a manufacturer or marketer motivates, communicates, sells, ships, stores, delivers, and services the customer's expectations and the products' needs"* (McCalley 1996, p. 4). The definition covers quite a broad area where communications, distribution and selling aspects of marketing are included. Rosenbloom (2012, p. 9) defines channels as *"the external contractual organisation that management operates to achieve its distribution objectives".* This definition encompasses only the distribution aspect of marketing channels. Past research defines marketing channels as *"sets of interdependent organisations involved in the process of making a product or service available for use or consumption"* (Stern et al. 1989, p. 57) which shows that service and products both are delivered through marketing channels. Kotler and Armstrong (2010) also incorporate services within their definition of channels as they argue marketing channels involve every activity of the company, which helps the products and services to reach its target market.

From the definitions, it is apparent that marketing channels involve two key roles, i.e., distribution and communication of products and services. Generally, marketing channels are perceived as the mediums of distribution activities (Coughlan et al. 2006). However, as wholesalers, distribution agents, and retailers are increasingly being involved in promotional activities, the role of marketing channels thus includes not only supplying goods and services to the right place, quality and quantity but involves promotional activities as well (Coughlan et al. 2006). For a long time, the distribution aspect of marketing channels was deemed as the channel's primary role while transmission and processing of information were assumed as the channel's secondary role (Glazer 1991). However, the intensity of information and opportunity created by marketing channels makes the communications role quite remarkable as well (Glazer 1991). Hence, a shift from the traditional role of marketing is transcending to an extended position of a medium for both communications and distribution from a distribution-only medium (Buttle 2008).

According to Neslin et al. (2006), channels are contact points or medium through which firms and customers interact. Channel role includes distribution and communications. However, Neslin et al. (2006) argue that the term "interact" does not include one-way communication methods such as TV advertising. Hence, within the scope of service delivery channels, one-way communications are not included within the role of marketing channels.

To understand multichannel services, it is also important to discuss different channel types, specifically physical and virtual channels (Trenz 2015). Virtual channels consist of technologically advanced telecommunication, information and multimedia technologies (Sousa & Voss 2006), for example, internet, telephone, ATMs, interactive TVs, interactive kiosks, retail self-checkout, and so on. To provide a service, virtual channels do not require human interaction. On the other hand, physical channels consist

of human interaction and services provided through a physical (bricks and mortar) infrastructure, for example, face to face service provided by doctors, retail check out, hotel service desk, logistics support (warehouse, transportation), and so on. In addition, the company's services channels can be grouped based on different functions within the company: salesforce (i.e., field management, service representation), telephony (i.e., traditional telephones, telex, call centre contact), outlets (stores, retail branches, kiosks, depots), direct marketing (direct mail, TV), m-commerce (SMS, mobile channels, text messaging and mobile internet) and e-commerce (internet, email, interactive TV) (Payne & Frow 2004).

In recent decades, the number of channels which consumers can assess, choose, compare and finally avail a service from is increasing (Kumar 2010; Pantano 2014; Wagner et al. 2013). Many authors have defined multichannel services as the use of more than one channel. For example, *"a company using two or more marketing channels to reach one or more market segments"*(Kotler et al. 2015, p. 410); *"When an organisation uses more than one channel type in an attempt to reach its target market segments"* (Stojkovic et al. 2016, p. 107). From a retailing perspective, Berman and Thelen (2004, p. 147) define multichannel retailing as *"a situation where the retailer enables the consumers to shop in several different types of channels such as traditional stores, catalogues and e-commerce"*. Zhang et al. (2010, p. 168) define multichannel retailing as *"a set of activities involved in selling merchandise or services to consumers through more than one channel"*.

Although some authors define multichannel as how the organisations use more than one channel to reach their target markets, some look at multichannel services from a virtual and physical channel perspective. Sousa and Voss (2006) define multichannel service as service consisting of physical and virtual elements that are provided through diversified

channels. Multichannel service is characterised by the design, execution, organisation and assessment of different channels to improve customer value through customer relationship management (Neslin et al. 2006). A critical perspective on multichannel service is providing importance to customers as the strategy to increase a firm's profitability (Boulding et al. 2005; Payne & Frow 2005). From a multichannel perspective, a customer's progress through buying decision such as need recognition, information search, evaluation, purchase and after-sales-service can take place at different channels (Blázquez 2014; Hsieh et al. 2012; Verhoef et al. 2007).

Prior research on multichannel marketing has focused on several issues. (Avery et al. 2012) identify the benefit of adding new channels when services are offered through a single channel. Verhoef et al. (2007) show switching behaviour between channels. Channel migration or the jump from one channel to another to avail services have been the focus of different research as well (Ansari et al. 2008; Gensler et al. 2007; Venkatesan et al. 2007; Verhoef et al. 2007). Similarly, several research has focused their attention on conceptualising channel choice and channel preference of different consumers (Gensler et al. 2012; Kumar & Venkatesan 2005; Montoya-Weiss et al. 2003). Ansari et al. (2008) evaluate the value of multichannel versus single-channel customers. Kushwaha and Shankar (2008) encapsulate different marketing efforts and allocation of resources on different channels and their effect on channel management. Currently, channel integration (Banerjee 2014; Hossain et al. 2019; Sousa & Voss 2006) and data analytics and business intelligence (Wedel & Kannan 2016) have become areas of interest for academics in relation to multichannel research.

2.1.2 Defining Quality

Quality has been defined in many ways (Crosby 2006). Definition of quality can be specific for products or services, different industries and level of dimensionality (Wicks & Roethlein 2009). There is no universally accepted definition of quality (Kara et al. 2005). Likewise, Grönroos (2000) argues that there is no single definition of quality as it is an indistinct and a complicated concept. Furthermore, several other authors explain quality as elusive (Parasuraman et al. 1985; Smith 1999), unresolved (Caruana et al. 2000), difficult to comprehend (Brady & Cronin 2001), and far from conclusive (Athanassopoulos 2000). From the Japanese point of view, quality is a concept producing "zero defects" (Parasuraman et al. 1985), while others view it as conformance to requirements (Crosby 1979). However, the International Organization for Standards provides a commonly accepted definition of quality *"the degree to which a set of inherent characteristics fulfils requirements"* (ISO 2005).

The more uncomplicated view of quality can be explained from either a customer-oriented perspective or a production-oriented perspective (Gummesson 1991). While production-oriented view focuses on the technical and manufacturing side of quality to standardise production (Crosby 1984; Kasper et al. 1999; Oliver 1997), customer-oriented view focuses on customer perception or behavioural aspect of quality (Brady & Cronin 2001; Parasuraman et al. 1988; Rust & Oliver 1994). Within service research, the customer-oriented approach has become more prevalent (Schneider & White 2004). The American Society for Quality agrees that quality is a subjective term, and each person and sector have its own definition. From a technical standpoint, it can be the characteristics that a product or service bear to satisfy needs, or it can be a product or service free of defects (American Society for Quality 2020). Centring the customer-oriented approach, the International Telecommunication Union (2008) defines quality as

"the totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs". Within this context, quality should be viewed from a customer perspective, where quality is the mean to measure performance level.

2.1.3 Defining Service Quality

Service quality tests how much consumer needs have been met by the service delivered. The term *perceived service quality* is generally used in academic literature to measure the intangible nature of quality within service offerings (Yarimoglu 2014). Service quality is a mean of outperforming competitors and maintaining long-term sustainable profitability in a service landscape (Kandampully 1998; Parasuraman et al. 1985). It has long been an influential research agenda for academia and the service industry (Wang 2015). The perception of service quality by customers is the product of a contrast between the company's assurance of service (expectation) and what customers actually experience (service performance) (Grönroos 1984; Lovelock 2011). Prior studies define perceived service quality as a difference between customers' expectation of service performance with how the service delivery was perceived (Grönroos 1984; Parasuraman et al. 1988).

The difference score approach by Parasuraman et al. (1988) is widely accepted in service quality literature. However, it also faced criticism (i.e., Babakus & Boller 1992) due to using expected score measurement. Several studies focus only on performance measure to define and conceptualise service quality (Brady & Cronin 2001; Dabholkar et al. 1996). Brady and Cronin (2001) argue perception scores performed better than the difference scores.

Research in service quality mostly focuses on a single channel aspect where physical and virtual quality are conceptualised separately. Service quality research initially concentrated on conceptualising dimensions of physical quality (Berry et al. 1988; Cronin

& Taylor 1992; Dabholkar et al. 1996; Frost & Kumar 2000; Grönroos 1984; Rust & Oliver 1994). With the advent of electronic channels, research on service quality shifted its focus towards conceptualising dimensions of electronic services (Aladwani & Palvia 2002; Barnes & Vidgen 2002; Chae et al. 2002; Parasuraman et al. 2005). However, within the studies mentioned above, offline and online channels are considered as delivering service only through a single platform without the assistance or influence of other channels. The findings of these studies do not sufficiently explore consumer evaluation and behavioural outcomes of services provided through multiple channels. Hence, the conceptualisation of service quality from a multichannel perspective is necessary. The next section discusses service quality conceptualisation within the single-channel aspect and then moves into analysing multichannel service quality literature.

2.2 Service Quality in A Single Channel Setting

There have been various studies in recent decades on developing service quality measures. These studies have predominantly focused on conceptualising service quality from a single channel perspective; either physical channel or virtual channel (Sousa & Voss 2006). Service quality literature on multichannel services is based on the development of theory from these single-channel studies (Banerjee 2014; Hossain et al. 2019). Hence, this study first investigates service quality theories based on physical channels and then service quality theories based on virtual quality to understand how the literature on single-channel impacts multichannel service quality and what are the research gaps.

2.2.1 Physical Quality

The earliest conceptualisation of service quality is proposed by Sasser et al. (1978). They argue consistency, completeness, security, availability, attitude, condition, and training

of service providers are factors which raise the service quality. The first service quality model, however, was proposed by Grönroos (1984) which measured perceived service quality based on three dimensions, i.e. technical quality, functional quality, and corporate image. Technical quality refers to what the customer gets from the service provider; functional quality refers to how the customer gets it; corporate image is the result of how a customer perceives the firm after receiving the service (Grönroos 1984). Although service quality model by Grönroos (1984) serves as one of the foundational theories of physical quality, it faced criticism for having limited dimensions (Carman 1990; Dabholkar et al. 1996).

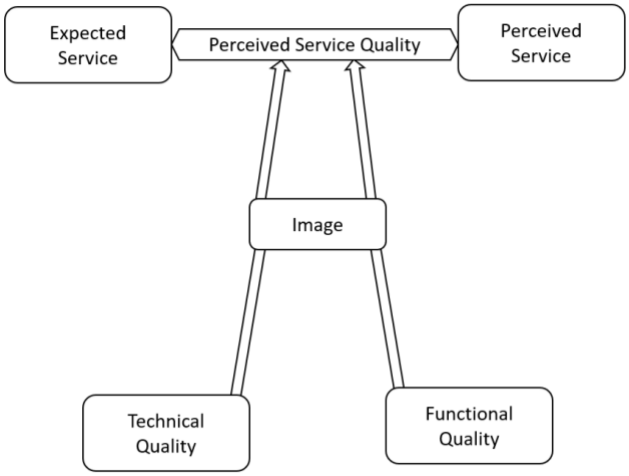

Figure 2-1 Service quality model proposed by Grönroos (1984)

Most service quality studies on physical channels are focused on the landmark scale of service quality or the multidimensional SERVQUAL model (Parasuraman et al. 1988). Based on the findings of 12 focus group discussions, Parasuraman et al. (1985) consider service quality as the gap between how consumer perceived the actual service with their expectation of services offered and conceptualised service quality based on this "gap score". Parasuraman et al. (1985) offer ten dimensions of physical service quality which are tangibles, reliability, responsiveness, communication, credibility, security, competence, understanding/knowing customers, courtesy, and access. Later,

Parasuraman et al. (1988) developed the SERVQUAL model reducing the ten dimensions to five dimensions, namely, reliability, responsiveness, assurance, empathy and tangibles (Table 2-1).

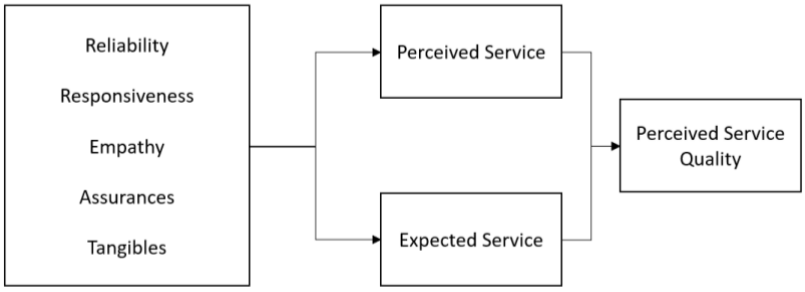

Figure 2-2 SERVQUAL Model, Parasuraman et al. (1988)

Table 2-1 SERVQUAL model proposed by Parasuraman et al. (1988)

Dimensions	Description
Reliability	Refers to the service provider's ability to complete the promised service accurately and dependably.
Responsiveness	Refers to the service provider's inclination to provide quick service and help customers.
Assurance	Refers to the courtesy and knowledge of the employees and their ability to arouse faith and trust.
Empathy	Refers to the service provider's provision of individual care and attention to customers.
Tangibles	Refers to the physical facilities, equipment, personnel and communication materials.

SERVQUAL has been used to measure the quality of service in different service sectors, including the health sector (Carman 1990; Headley & Miller 1993; Kilbourne et al. 2004; Lam 1997); fast food (Lee & Ulgado 1997); information systems (Jiang et al. 2000); telecommunications (Van der Wal et al. 2002); banking (Lam 2002; Zhou et al. 2002); retail chain (Parasuraman et al. 1994); and library services (Cook & Thompson 2001). SERVQUAL has also been implemented for country context these have included: the United States (Babakus & Boller 1992; Jiang et al. 2000; Kilbourne et al. 2004); Cyprus (Arasli et al. 2005); China (Lam 2002; Zhou et al. 2002); Hong Kong (Kettinger et al. 1995; Lam 1997); Australia (Baldwin & Sohal 2003); the UK (Kilbourne et al. 2004);

Korea (Kettinger et al. 1995); South Africa (Van der Wal et al. 2002); and the Netherlands (Kettinger et al. 1995).

Despite its worldwide acceptance and use, the SERVQUAL model has received criticism in several aspects. First, SERVQUAL is a generic model. Hence, the applicability of this model in customised context has been questioned in several studies (Babakus & Boller 1992; Carman 1990; Dabholkar et al. 1996). Second, assessing quality perception as the difference between perception and expectation or the "gap score" has also faced criticism (Buttle 1996). Cronin and Taylor (1992) argue service quality should be measured only based on the perception of quality rather than gap score. Third, SERVQUAL is criticised as focused just on the process of service delivery rather than outcomes of service quality perception (Brady & Cronin 2001; Gronroos 1990). Finally, methodologically, the SERVQUAL model has been criticised due to its item-total correlation (Carman 1990), construct validity (Peter & Churchill Jr 1986) and low-reliability score (Brown et al. 1993). Furthermore, different studies argue service quality as being influenced by sub-dimensional level factors and criticise the unidimensional nature of SERVQUAL (Brady & Cronin 2001; Dabholkar et al. 1996).

Despite the weaknesses mentioned above, SERVQUAL is distinct to other models of service quality and is still widely accepted. However, due to the nature of service complexity and multidimensional aspect of customers' perception of service quality, service quality model should be context-specific, hierarchical and multidimensional.

Instead of measuring service quality by using gap-based SERVQUAL scale, Cronin and Taylor (1992) propose the performance-based SERVPERF scale. Performance-based SERVPERF follows the same SERVQUAL dimensions structure. However, the main difference between SERVPERF and SERVQUAL is SERVQUAL measures both

expectations and performance perceptions while SERVPERF does not include expectation part of the SERVQUAL model. SERVPERF argues that respondents provide their ratings by comparing performance perceptions with performance expectations only (Carrillat et al. 2007).

In addition to SERVQUAL and SERVPERF models, several researchers have focused on other service quality dimensions. Reflecting on the service quality dimensions of Grönroos (1984), Rust and Oliver (1994) propose a three-dimensional model which includes functional quality, technical quality and customer-employee interactions as factors influencing service quality perception.

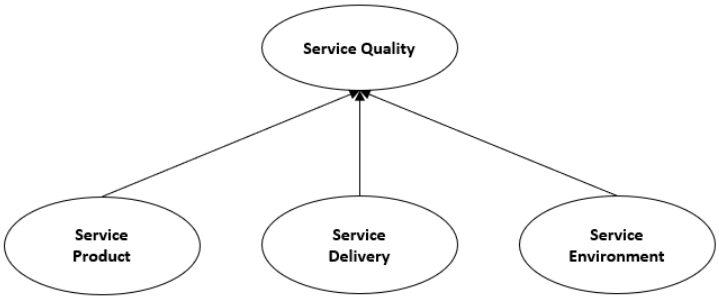

Figure 2-3 Service quality model by Rust and Oliver (1994)

For retail store service quality, Dabholkar et al. (1996) develop a multidimensional and multilevel model of Retail Service Quality Scale (RSQS) which includes, physical aspect, reliability, personal interaction, problem-solving and police as its dimensions. Dabholkar et al. (1996) address the issue of unidimensionality of the SERVQUAL model through this paper by proposing the multidimensional RSQS. Adopting the gap model (Parasuraman et al. 1985), Frost and Kumar (2000) offer an internal service quality model called INTSERVQUAL.

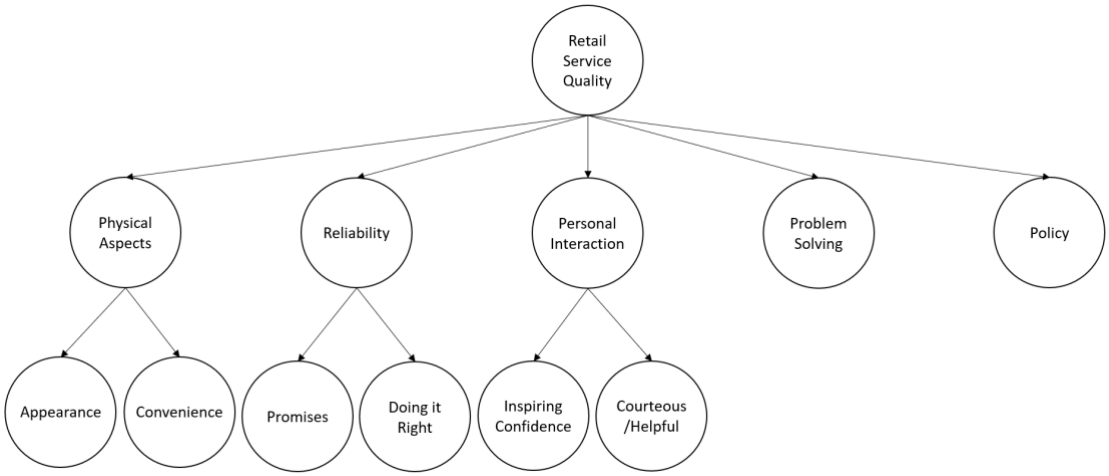

Figure 2-4 Retail Service Quality Scale by Dabholkar et al. (1996)

Finally, Brady and Cronin (2001) proposed a model of measuring service quality which includes interaction quality, physical service environment quality and outcome quality as factors affecting service quality. According to Brady and Cronin (2001), interaction quality refers to the perception formed by attitude, behaviour and expertise; physical service environment quality refers to perception formed by physical aspects such as ambient conditions and design; finally outcome quality refers to the perception formed by service issues such as waiting time and other tangibles. Brady and Cronin (2001) further propose nine sub-dimensions of interaction quality, outcome quality and physical environment quality; namely, behaviour, social factors, waiting time, attitude, expertise, design, ambient conditions, tangibles and valence. Service quality model proposed by Brady and Cronin (2001) is a successful integration of works of Grönroos (1984) and Rust and Oliver (1994). As mentioned by the authors, the limitations of this model lie in the generalisability of the model for context-specific issues.

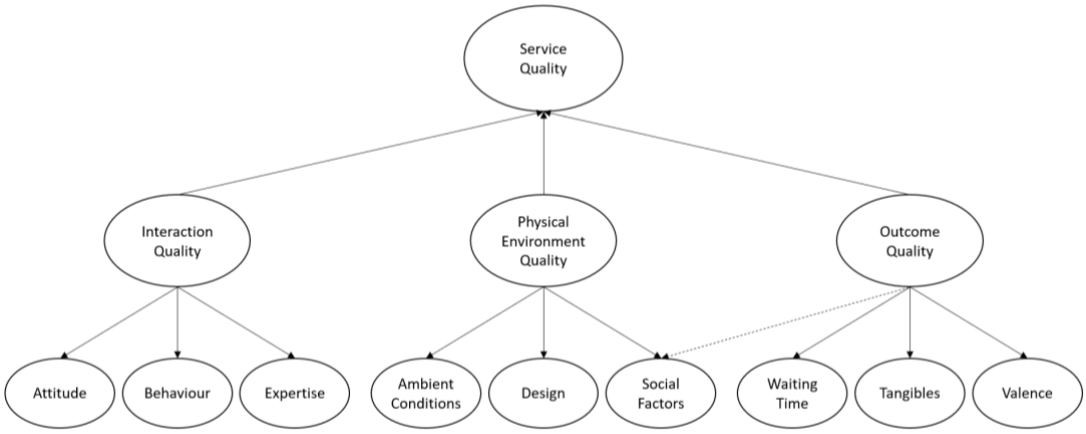

Figure 2-5 Service quality model proposed by Brady and Cronin (2001)

In creating the relation between physical quality with multichannel service quality, Sousa and Voss (2006) divide physical services into two types; namely, interpersonal services (service provided via a human interface, e.g. face-to-face at a physical facility, by phone, and so on) and services without human contact (logistics fulfilment). According to Sousa and Voss (2006), interpersonal service has two dimensions; routine and customer support (responsive, compensation and contact) while reliability, inventory availability and timeliness define logistic fulfilment.

2.2.2 Virtual Quality

The literature on service quality regarding virtual or electronic context (websites, mobile platform, social media, and so on) has initially focused on the SERVQUAL model. However, due to lack of Information Communication Technology (ICT) context of the SERVQUAL model, the literature faced criticism on reliability and validity (Jiang et al. 2000; Kettinger & Lee 1994; Orlikowski & Iacono 2001). Parasuraman et al. (2005) argue that the study of quality of electronic service involves the development of scales beyond the scales of quality of physical service. Since the SERVQUAL model is based on direct customer-service communication, dimensions of this model thus cannot be directly transposed to electronic service quality context (Fassnacht & Koese 2006). To address

this issue, different studies have conceptualised dimensions specific to electronic services. Such as, Yoo and Donthu (2001) propose four dimensions of online retailers' web site quality, i.e., ease of use, aesthetic design, processing speed, and security. Aladwani and Palvia (2002) propose four dimensions of web service quality, i.e., specific content, content quality, appearance and technical adequacy. Barnes and Vidgen (2002) offer five dimensions in their eQual model, i.e., usability, information, design, trust and empathy as virtual quality dimensions. Loiacono et al. (2002) offer WebQual model proposing twelve dimensions, i.e., informational fit-to-task, tailored communications, trust response time, ease of understanding, intuitive operations, visual appeal, innovativeness, emotional appeal, consistent image, online completeness, and relative advantage. Wolfinbarger and Gilly (2003) propose four dimensions of etail quality model, i.e., web site design, privacy/security, fulfilment/reliability and customer service as website service quality dimensions. However, criticism regarding these studies exists mainly due to their lack of a broader definition of electronic services (Fassnacht & Koese 2006).

To overcome the limitations of prior literature, Parasuraman et al. (2005) propose E-S-QUAL or electronic service quality model. E-S-QUAL model is unique in the sense that it enables the capture of human-technology interaction for any web-based e-service platform (Sousa & Voss 2006). E-S-QUAL model consists of four dimensions, namely, efficiency, system availability, fulfilment, and privacy, which is relevant for a website's entire customer base. Furthermore, Parasuraman et al. (2005) propose three more dimensions, namely, responsiveness, compensation and contact as E-RecS-QUAL, which are relevant for customers with service recovery experience.

Table 2-2 E-S-QUAL and E-RecS-QUAL model by Parasuraman et al. (2005)

Dimensions	Subdimensions	Definition
E-S-QUAL	**Efficiency**	Response time and ease of use of the site
	Systems availability	Proper technical functionality of the site.
	Fulfilment	Availability of promised items and ability to fulfil order delivery.
	Privacy	Security of using the site and protection of customer information.
E-RecS-QUAL	**Responsiveness**	Effective management of service issues and returns.
	Compensation	Proper compensation to customers for problems.
	Contact	Ability to provide proper assistance through an online representative or call centre.

Similarly, Fassnacht and Koese (2006) propose quality of electronic service as a hierarchical construct having three main dimensions, i.e., environment quality, delivery quality, and outcome quality and nine sub-dimensions, i.e., graphics quality, clarity of layout, attractiveness of selection, information quality, ease of use, technical quality, reliability, functional benefit, and emotional benefit.

Wixom and Todd (2005) combine information quality and system quality in their model and showed beliefs of information and system quality form object-based attitudes about information and system satisfaction, and that in turn affect behavioural perceptions such as perceived usefulness and perceived ease of use, and ultimately behavioural attitude and usage intention. Wixom and Todd (2005) conclude that dimensions of information quality are completeness, accuracy, format and currency, while dimensions of system quality are reliability, flexibility, integration and accessibility.

Built on the integrated technology usage framework of Wixom and Todd (2005), Xu et al. (2013) propose the 3Q framework by analysing the position of service quality within system quality and information quality, in the adoption of websites. Comparing the WT model to the corresponding elements of the 3Q model, similar results have been generally found in terms of R^2 and the importance of path coefficients. There are, however, differences in the specific quality dimensions of system quality and information quality.

In the sense of e-services, format and the currency have no major impact on information quality. Similarly, accessibility and reliability do not have a major impact on system quality. Nevertheless, timeliness has a significant effect on system quality that has been found in the WT model to be negligible. The 3Q model consists of tangibles, responsiveness, empathy, service reliability and assurance as service quality dimensions.

Although the studies mentioned above on service quality focus mainly on website quality, they do not adequately address other virtual service platforms such as mobile devices or social media services. To address mobile service quality, Chae et al. (2002) identify four primary dimensions of generic mobile platform, i.e. connection quality, content quality, interaction quality and contextual quality. Tan and Chou (2008) offer perceived usefulness, perceived ease of use, content, variety, feedback, experimentation and personalisation as specific dimensions for mobile service quality.

To conceptualise service system in service quality research, Akter et al. (2016) propose three dimensions, i.e. system quality, interaction quality, information quality and nine sub-dimensions, i.e. system reliability, system efficiency, system flexibility, system privacy, responsiveness, assurance, empathy, utilitarian, hedonic as factors influencing service system quality in mHealth service systems. In addition, adopting the E-S-QUAL approach, Kim and Nitecki (2014) suggest four dimensions (efficiency, system availability, privacy and fulfilment) for social media services quality.

Lastly, to evaluate service quality Sousa and Voss (2006) combine front and back-office operations and propose virtual service quality having virtual fulfilment, efficiency, ease of use, speed, system availability and privacy as factors influencing virtual quality. Sousa and Voss (2006) argue that these dimensions are associated with web site quality and can

be generalised to other platforms as well. A table summarising the service quality models have been presented in Appendix 4.

2.3 Multichannel Service Delivery and Integration Quality

Services provided through diversified channels consisting of physical element (i.e., face to face service provided by doctors, retail check out, hotel service desk, logistics support) and virtual elements (i.e., internet, telephone, ATMs, interactive TVs, interactive kiosks, retail self-checkout) are considered as multichannel services (Sousa & Voss 2006). Within a multichannel system, customers' perception of service quality does not only depend on one single channel. From a multichannel perspective, a customer's progress through buying decisions such as need identification, information search, evaluation, actual purchase, and post-sales service can take place at different channels (Blázquez 2014; Lemon & Verhoef 2016). Multichannel customers perceive the quality of all the channels to judge the overall service quality of the service provider (Montoya-Weiss et al. 2003). To sufficiently conceptualise service quality within multichannel service, it is essential to consider customer experience formed across all the touchpoints of the firm through several channels (Sousa & Voss 2006). Consistent with these views, Sousa and Voss (2006) define multichannel service quality as *"The quality of the overall service experienced by a customer, encompassing all the existing physical and virtual components" (p. 359).*

2.3.1 Defining Multichannel Integration Quality

Service quality in a multichannel environment comprises three components: physical (face-to-face services, logistical support), virtual (web site, mobile), and integration quality (seamless service experience across channels) (Sousa & Voss 2006). A firm which provides services through multiple channels may have a right level of physical and virtual

quality. However, due to the inconsistencies between the channels, the overall quality perception may below. Hence, the notion of integration of service elements within all the channels is an essential aspect of multichannel service quality. Saeed et al. (2003) recommend integrating information systems supporting physical and virtual channels to provide customer flexibility and facilitate the purchase process. Oh and Teo (2010) suggest multichannel retailer design a hybrid channel system by integrating all channel resources effectively, including employees, customers, and technology to provide a consistent customer experience. The notion of functional integration of physical and virtual channels in a multichannel system is vital to deliver a superior customer experience (Banerjee 2014). Successful integration of channels leads to obtaining a competitive advantage (Wakolbinger & Stummer 2013).

Various authors have offered their definition of multichannel integration. It is the scope of online and traditional channels to interact with each other and cooperate in different marketing activities (Yan et al. 2010, p. 434); the extent to which firms distribute products and services to customers through channels which are synchronised and complementary (Berger et al. 2002, p. 46); the strategy that involves decisions regarding how many channels to adopt, what sort of interactions is made with each channel and the purpose of each channel for the customers (Neslin et al. 2006). Cao and Li (2015) provide the most thorough definition of multichannel integration: *"The degree to which a firm coordinates the objectives, design, and deployment of its channels to create synergies for the firm and offer particular benefits to its consumers."* (Cao & Li 2015, p. 200).

From the extant literature, it is evident that the notion of integration plays the utmost important role within multichannel service quality. Sousa and Voss (2006) coin the term *integration quality* to address this phenomenon. Integration quality is a significant component of multichannel services and is defined as *"the ability to provide customers*

with a seamless service experience across multiple channels" *(Sousa & Voss 2006, p. 365).* The focus of integration quality is to capture the essential characteristics of physical and virtual channels as a whole and to provide a consistent customer experience through all the channels that a company utilises. Prior studies have shown integration quality results to a positive evaluation of the brand and better outcome for service providers (Emrich et al. 2015; Herhausen et al. 2015; Lee et al. 2018; Seck & Philippe 2013).

Based on these arguments, the author of this research defines multichannel integration quality as "*a service quality measure for customers using multiple channels of a firm to avail a service, where the key elements of all the service delivery channels are integrated and consistent with each other to provide a seamless customer experience"*.

2.3.2 Dimensions of Multichannel Integration Quality

Although there is a dearth of research conceptualising multichannel service quality, several views on dimensions and consequences of multichannel integration quality exist. The earliest conceptualisation of multichannel integration can be found in Saeed et al. (2003), who propose informational integration; content integration; and logistical integration as value-added services to create synergy between click and mortar stores. Saeed et al. (2003) conceptualise information integration as the integration of information related to store location, price, inventory assortments and so on within all the channels. Content integration is referred to as customers' ability to locate product details online and examine them in a physical store before purchasing. Finally, logistical integration is outlined as customers' ability to pick up and return products from a channel of their choice.

Berman and Thelen (2004) discuss different strategies to develop and manage an integrated multichannel system. According to Berman and Thelen (2004), to develop a

well-integrated multichannel system, firms should integrate promotions across channels, manage product consistency across channels, have an information system that integrates customer, pricing, and inventory data across channels, have a process which enables customers to order products online or via catalogue and pick up product in-store, and search for multichannel opportunities by creating strategic partnerships.

Bendoly et al. (2005) measure channel integration to investigate its effect on customer retention; however, it does not offer any dimensions of channel integration. Within the items to measure channel integration, Bendoly et al. (2005) discuss advertisement across channels, non-product information across channels, kiosks within stores to access the website, product assortments across channels, customers' ability to order online and pick up and return in-store.

The studies mentioned above are preliminary evidence of channel integration within the academic literature. However, these studies are not focused on service quality of multichannel services; instead, propose directions and strategies to create a synchronised multichannel system. Furthermore, these studies are at a conceptual phase and do not empirically test any dimensions of channel integration. Similar to the above studies, Neslin et al. (2006) and Payne and Frow (2004) have discussed strategies for companies to ensure a well-integrated channel system. These studies provide an excellent guideline to conceptualise and empirically test service quality factors affecting multichannel services.

Sousa and Voss's (2006) literature is among the first studies to address multichannel service quality. They coined the term multichannel integration quality (MCIQ) within service quality literature and proposed specific dimensions of MCIQ. Dimensions of MCIQ suggested by Sousa and Voss (2006) are channel-service configuration and

integrated interactions. Furthermore, Sousa and Voss (2006) propose breadth of channel choice and transparency of the existing channel-service configuration as sub-dimensions of channel-service configuration, while content consistency and process consistency as sub-dimensions of integrated interactions. Banerjee (2014) extends the work of Sousa and Voss (2006) by using a qualitative, case research data from banking customers and propose two new dimensions, i.e., appropriateness of channel-service configuration and transaction data and interaction data integration.

Although Sousa and Voss (2006) and Banerjee (2014) has successfully put forward critical dimensions of multichannel service quality and sketched the term integration quality within service quality literature, it is not without its limitations. The proposed dimensions (Table 2-3) are still at a conceptual level and require empirical evidence. Furthermore, there are several other dimensions such as reciprocity, privacy, security, service recovery accessibility, image consistency and system consistency, which has not been addressed in these studies.

Based on the dimensions proposed by Sousa and Voss (2006), several studies have put forward their models of channel integration. For example, Lee et al. (2018), Seck and Philippe (2013), and Shen et al. (2018) use channel-service configuration and integrated interactions as main dimensions and breadth of channel choice, transparency of channel-service configuration, consistency and process consistency as sub-dimensions to conceptualise channel integration. Hsieh et al. (2012) propose information consistency, channel accessibility, and personal data integration as dimensions of multichannel quality. Channel accessibility is a similar construct as breadth of channel choice while information consistency and personal data integration fall under content consistency as conceptualised by Sousa and Voss (2006).

Table 2-3 Integration quality dimensions and their definitions proposed by Sousa and Voss (2006) and Banerjee (2014).

Dimensions	Sub-Dimensions	Definition	Similar Constructs by other Authors
Channel-Service Configuration Quality	Breadth of Channel Choice	Refers to having alternate channels available for the customer to obtain a particular service.	Lee et al. (2018), Seck and Philippe (2013), Shen et al. (2018), Hsieh et al. (2012) (Channel accessibility); Lee and Kim (2010) (Flexibility in channel selection)
	Transparency of Channels	Refers to consumer awareness of the existence of different channels and associated services.	Lee et al. (2018), Seck and Philippe (2013), Shen et al. (2018), Wu and Chang (2016); Oh and Teo (2010) (Integrated promotion)
	Appropriateness of Channels	Refers to the suitability of channels for different services.	
Integrated Interactions	Content consistency	Consistency of both incoming and outgoing information between the firm and the customers across channels. Incoming information refers to an interaction between firm and customer which takes into account of that customer's previous interaction with the firm. Outgoing information refers to customers receiving the same response for a query posed through different channels.	Lee et al. (2018), Seck and Philippe (2013), Shen et al. (2018), Hsieh et al. (2012) (Information consistency and personal data integration), Wu and Chang (2016), Lee and Kim (2010), Oh and Teo (2010)
	Process Consistency	Consistency of different process attributes and customer-facing elements within the banking channels (e.g., service's feel, image, waiting times, employee discretion levels)	Lee et al. (2018), Seck and Philippe (2013), Shen et al. (2018), Wu and Chang (2016)

To conceptualise multichannel integration Oh and Teo (2010) use different dimensions compared to Sousa and Voss (2006) and Banerjee (2014). They propose information quality and service convenience as dimensions of multichannel interaction. Furthermore, Oh and Teo (2010) purports integrated product and pricing information, integrated

transaction information, integrated promotion information as subdimensions of information quality while integrated information access, integrated customer service, and integrated order fulfilment as subdimensions of service convenience (Table 2-4).

Lee and Kim (2010) and Wu and Chang (2016) combine the dimensions of Sousa and Voss (2006) and Oh and Teo (2010) to put forward their models of multichannel integration. Lee and Kim (2010) propose flexibility in channel selection, channel reciprocity, e-mail marketing effectiveness, information consistency and appreciation of store-based customer service as dimensions of cross-channel integration. Wu and Chang (2016) purport transparency of service configuration, information consistency, process consistency, and business ties as dimensions of multichannel integration.

Table 2-4 Channel integration dimensions proposed by Oh and Teo (2010)

Dimensions	Sub-Dimensions	Definition	Similar Constructs by other Authors
Information Quality	Integrated promotion information	Refers to awareness of different channels where promotion for channel A by channel B is aimed to drive customers of channel B to channel A.	Sousa and Voss (2006) and Banerjee (2014) Lee et al. (2018), Seck and Philippe (2013), Shen et al. (2018); Lee and Kim (2010) (E-mail marketing effectiveness)
	Integrated product and pricing information	Refers to consistent information of product and inventory across all channels.	Sousa and Voss (2006) and Banerjee (2014) Lee et al. (2018), Seck and Philippe (2013), Shen et al. (2018), Hsieh et al. (2012) Wu and Chang (2016), Lee and Kim (2010)
	Integrated transaction information	Refers to collecting information about consumer purchases from different channels and providing personalised information and service through various channels.	Wu and Chang (2016) (Business ties), Hsieh et al. (2012) (Personal data integration)
Service Convenience	Integrated information access	Refers to providing customers with the ability to access channel A's information through channel B.	Lee and Kim (2010) (Channel reciprocity)
	Integrated order fulfilment	Refers to providing logistical support for products purchased from channel A on channel B.	Wu and Chang (2016) (Business ties)
	Integrated customer service	Refers to customer service support for products purchased from channel A on channel B.	Wu and Chang (2016) (Business ties)

Although the papers mentioned above provide a somewhat good understanding of integration quality, there is a scope of conceptualising and providing empirical evidence of new dimensions which have not been addressed within multichannel services in prior studies.

Furthermore, these researches are quite fragmented and have overlapping definitions of different constructs. These papers have used different terms to address various dimensions of channel integration. For example, channel availability has been termed as breadth of channel choice (Banerjee 2014; Sousa & Voss 2006); channel accessibility (Hsieh et al. 2012) and flexibility of channel choice (Lee & Kim 2010). Similarly, channel reciprocity has been addressed as channel reciprocity (Lee & Kim 2010), business ties (Wu & Chang 2016) and integrated order fulfilment (Oh & Teo 2010). Content consistency (Banerjee 2014; Sousa & Voss 2006) has been addressed differently by different authors. Such as two of the constructs by Oh and Teo (2010), i.e., integrated product and pricing information and integrated transaction information covers the concept of content consistency. Hence, it is essential to collaborate the findings from different research under a unified view of dimensions of channel integration and provide concrete definitions of each dimension.

There are several other noteworthy studies which implicitly discusses different aspects of channel integration within their researches. Such as Madaleno et al. (2007) and Pantano and Viassone (2015) use only channel availability and cross channel consistency to determine multichannel strategies. White et al. (2013) show how design factor, ambient factor, and social factor in both offline and online context affect brand equity of an integrated multichannel firm. Hammerschmidt et al. (2015) use an approach where they conceptualise different alignable channel attributes such as choice, charge, convenience, confidence, and care. Hammerschmidt et al. (2015) argue that these factors are

determinants of satisfaction in both online and offline context. Cao and Li (2015), Neslin et al. (2006), Van Baal (2014), Emrich et al. (2015) and Bapat and Bapat (2017) discuss channel integration in varying level but do not propose any dimensions of integration quality.

2.4 Impact of Multichannel Service Quality on Services Outcomes

Service quality literature has focused on several behavioural aspects which are influenced due to consumer's perception of service. Studies include satisfaction (Brady & Cronin 2001; Dabholkar et al. 1996; Oliver 1997; Parasuraman et al. 1994; Zineldin 2006) loyalty intentions (Carlson et al. 2015; Fernández-Sabiote & Román 2012; Kumar et al. 2013), perceived value (Hartline & Jones 1996; Parasuraman et al. 2005; Sweeney et al. 1999), purchase intention (Herhausen et al. 2015; Holloway & Beatty 2008; Pantano & Viassone 2015; Schaefers & Schamari 2015; Sparks et al. 2013; Van Vaerenbergh et al. 2012; Yoo & Donthu 2001), trust (Blut et al. 2015; Collier & Kimes 2013; Sparks et al. 2013), word of mouth intention (Hartline & Jones 1996; Holloway & Beatty 2008; Reinders et al. 2008; Van Vaerenbergh et al. 2012), search intention (Herhausen et al. 2015), profitability (Larivière 2008) and so on as outcomes of service quality.

On the other hand, research on the consequences of MCIQ and its impact on service quality perception is rare (Herhausen et al. 2015). Only a few outcomes have been conceptualised within MCIQ literature so far. For example, Van Baal (2014) uses the term harmonisation to address MCIQ and argues harmonisation influences customer loyalty and retention rate. Van Baal (2014) also claims that harmonisation causes channel cannibalisation. Shen et al. (2018) purport that factors of multichannel integration lead to multichannel usage intention. Wu and Chang (2016) show the relationship between channel integration with online purchase intention through online perceived value. Oh

and Teo (2010) argue that dimensions of channel integration impact customer value positively. Cao and Li (2015) describe several mechanisms that influence sales growth by cross-channel integration. Hammerschmidt et al. (2015) empirically validate choice, convenience, charge, care and confidence as alignable channel facets affecting overall satisfaction. Herhausen et al. (2015) base their conceptual model of offline-online integration on technology adoption research and diffusion theory. They argue that perceived service quality and perceived risks are mediators between channel integration and behavioural outcomes such as search intentions, purchase intentions, and payment willingness. Furthermore, Herhausen et al. (2015) show online shopping experience as a moderator of channel integration and behavioural outcomes. Bendoly et al. (2005) argue that a higher level of channel integration will reduce the perception of risk of product unavailability. Product unavailability may encourage customers to switch to an alternative provider. Hence, channel integration encourages loyalty and increases the retention rate of customers (Bendoly et al. 2005). Finally, Schramm-Klein et al. (2011) argue that the integration of channels has a significant impact on customer loyalty, moderated by a strong brand image and consumer trust.

The following section discusses in detail some of these significant outcomes of MCIQ, as explained in different studies:

2.4.1 Satisfaction

Service quality literature has frequently addressed satisfaction as an outcome (e.g., Brady & Cronin 2001; Dabholkar et al. 1996; Oliver 1997; Parasuraman et al. 1994; Zineldin 2006). Measurement of satisfaction is becoming an industry in itself (Mittal et al. 2016). Satisfaction is defined as a customer's overall judgment regarding a product or service that provided (or is providing) a pleasurable level of consumption-related fulfilment

(Oliver 2014). It is an overall evaluation of the offers experienced through the service provider (Burnham et al. 2003).

Within multichannel services, satisfaction has been primarily focused on different studies to gauge customer perception of multichannel (Blázquez 2014; Dholakia et al. 2010; Neslin & Shankar 2009; Verhoef et al. 2007). Past research has shown that service quality provided in both offline and online channels determines satisfaction (Montoya-Weiss et al. 2003). It has also been studied from an individual channel perspective, where channel satisfaction has been modelled and validated against different channel attributes (Hammerschmidt et al. 2015). Satisfaction is measured separately as an outcome for physical quality (Bitner 1992; Booms & Bitner 1981; Hammerschmidt et al. 2015; Iacobucci et al. 1995; Lucas 2003; Pantano & Viassone 2015; Sands et al. 2015) and, for virtual quality (Blut et al. 2015; Collier & Kimes 2013; Holloway & Beatty 2008). It is an essential construct in exploring channel relationship and is the motivation for participants to stay with the channel (Geyskens et al. 1999).

Satisfaction as an outcome is the most prominent finding to emerge from the analysis of MCIQ literature. The notion of a greater degree of integration between offline and online networks is strongly linked to satisfaction (Rosenbloom 2007; Sousa & Voss 2006; Stojkovic et al. 2016). Combining channels and channel integration leads to satisfaction (Cao & Li 2015; Montoya-Weiss et al. 2003; Van Birgelen et al. 2006). Compared to single-channel customers, multichannel customers perceive higher satisfaction due to an enhanced portfolio of services provided by multichannel firms (Herhausen et al. 2015). Some articles on channel integration provide empirical evidence showing the relation between MCIQ and satisfaction (Hsieh et al. 2012; Seck & Philippe 2013; Wang, H et al. 2016).

2.4.2 Loyalty

Loyalty is defined as "*a deeply held commitment to rebuy or repatronise a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behaviour."* (Oliver 1997, p. 392). Loyal customers are more likely to rebuy the same product or return to the same retailer, engage in a positive word of mouth, and offer a premium price for their preferred brand (Kandampully & Suhartanto 2003). Multichannel firms foster customer loyalty by increasing points of contact with customers, offering various channels to avail services, providing diverse services and overall ensuring customer convenience (Cassab & MacLachlan 2006). Within multichannel perspective, loyal customers will recommend a service provider to others, spend more time shopping and return to service provider's online or offline store in the future (Kwon & Jain 2009; Lee & Kim 2010). Several other studies on multichannel marketing are attentive on loyalty intentions (e.g., Carlson et al. 2015; Fernández-Sabiote & Román 2012; Kumar et al. 2013).

From MCIQ point of view, the synergy between offline and online channels ensures seamless service experience, enriching customer satisfaction, strengthening the brand image of the provider and ultimately creating loyalty in both channels (Kwon & Lennon 2009). Lee and Kim (2010) argue that cross-channel integration strategies induce consumers to a significant demonstration of higher loyalty towards the service provider. Several other studies of MCIQ have focused on loyalty as an outcome (Montoya-Weiss et al. 2003; Neslin & Shankar 2009; Seck & Philippe 2013). Van Baal (2014) analyses the effect of channel integration on sales quantity and cannibalisation. Van Baal (2014) argues that in the short-term channel integration causes both sales and cannibalisation. Hence, it is confusing whether channel integration is beneficial or not. However, in the

long run, channel integration increases customer loyalty which indicates integration is beneficial for the firm. Channel integration leads to repurchase intentions (Lee et al. 2018; Wang, H et al. 2016), retention (Hsieh et al. 2012; Li et al. 2018) and positive word-of-mouth (Lee et al. 2018). These attributives directly or indirectly show the influence of loyalty intentions within MCIQ.

Data integration, as discussed earlier, enables firms to create a clear picture of consumer behaviour, buying patterns and trends (Cao & Li 2015). Leveraging these insights, firms can understand and respond to consumers' needs and wants in a more personalised manner (Stone et al. 2002). This strategy, in turn, increases the chance of creating more loyal customers and build a long-term relationship with them (Cao & Li 2015).

2.4.3 Customer Value

Within multichannel marketing, the importance of customer value has been conceptualised in both offline (Babin et al. 1994; Holbrook 1999) and online (Wolfinbarger & Gilly 2001) context. Customer value is the perception of net benefit against the cost associated with receiving a service (Zeithaml 1988). Research has shown that providing services through multichannel results to utilitarian and hedonic value (Dholakia et al. 2010; Kwon & Jain 2009). Multichannel services facilitate utilitarian value by allowing customers to search for product information, find different product details, and compare products easily through various channels offered by the firm (Noble et al. 2005). From the hedonic perspective, multichannel services enable customers to view themselves as "Smart Shoppers" (Verhoef et al. 2007) and facilitate consumers' "Variety Seeking Behaviour" (Kwon & Jain 2009).

Few studies on MCIQ has focused attention on customer value as an outcome of channel integration. Wu and Chang (2016) show the relationship between channel integration

with online purchase intention through online perceived value. Oh and Teo (2010) argue that dimensions of channel integration impact customer value positively. Wang, T et al. (2016) indicate that customer value is an outcome of combined e-service and physical service quality.

2.4.4 Customer Engagement

Consumer Engagement is a marketing term which has been used in several kinds of literature since 2005 (Brodie et al. 2011). Due to increased competitiveness and dynamic nature of the business, "consumer engagement" receives quite a lot of attention in both business and academics. However, literature related to defining and differentiating consumer engagement from other marketing term is still limited (Brodie & Hollebeek 2011). Vivek et al. (2012, p. 133) have defined engagement as "*the intensity of an individual's participation in and connection with an organization's offerings and/or organizational activities, which either the customer or the organization initiate".* Hollebeek (2011) defines "customer brand engagement" and refers it to a state of consumers mind which is brand-related, and context depended and is characterised by emotional, cognitive, and behavioural activity in terms of interaction with brands.

Evidence has suggested the implication of customer engagement in multichannel services (Kumar & Venkatesan 2005; Van Bruggen et al. 2010; Verhoef et al. 2010). Though no empirical evidence exists, research has indicated customer stimulation or engaging them to use multiple channels would increase profitability (Kumar & Venkatesan 2005). Verhoef et al. (2010) suggested that channel strategies can moderate the effects of antecedents of customer engagement. Hennig-Thurau et al. (2010) have signified the effect of new media channels, i.e. Facebook, Google, Twitter, and so on and how their different facets affect customer-firm interactions.

Within MCIQ literature, only one article has focused on evidencing customer engagement as an outcome of channel integration (Lee et al. 2018). Using customer engagement scales (Vivek et al. 2014), Lee et al. (2018) empirically evidence channel integration results to customer engagement and its three drivers, i.e., conscious attention, enthused participation, and social connection. Conscious attention refers to *"the degree of interest the person has or wishes to have in interacting with the focus of their engagement"*; enthused participation refers to *"the zealous reactions and feelings of a person related to using or interacting with the focus of their engagement";* and social connection refers to *"the enhancement of the interaction based on the inclusion of others with the focus of engagement, indicating mutual or reciprocal action in the presence of others"* (Vivek et al. 2014, p. 407).

2.4.5 Cross-Buying Intention

Several studies on multichannel strategies have focused on cross-buying intentions as an essential outcome of multichannel usage (Kumar & Venkatesan 2005; Neslin et al. 2006). However, within MCIQ literature, only one study indicates interest to alternatives as channel integration outcome (Li et al. 2018). Kumar et al. (2008) define cross-buying as the total number of different product that a customer has brought from a business, calculated from the first purchase. Reinartz and Kumar (2003) argue that cross-buying is related or unrelated sets of products or services that a customer buy from a firm. From a service marketing point of view, cross-buying is when a customer purchases additional products from the same service provider (Ngobo 2004).

Multichannel integration not only enables consumers to purchase products from different channels but also enables firms to sell additional products to their customers by encouraging cross-buying (Berry et al. 2010; Neslin et al. 2006). For example, firms can

encourage customers to browse through their products in online channels, afterwards realising product availability customers can go to the retailer's physical store. Consumers have lower expectations for service once in the shop and can be prone to cross-sales (Neslin et al. 2006). Having several channels further enables retailers to maintain contact with customers and send offers which increase cross-selling chances (Berry et al. 2010).

In terms of multichannel services, cross-buying can be an essential outcome of MCIQ. Customers usually use different channels to purchase products from different categories (Lynch Jr & Ariely 2000). Kumar and Venkatesan (2005) argue that customers who utilise multiple channels to purchase different products from a firm, provide higher revenue, are more active and perceives more value. For instance, companies may use direct mail, catalogues and websites to improve their customer relationships (Zhang et al. 2010), and then funnel them into stores (Gulati & Garino 1999). Cross-selling incentives are also the product of cross-promotions, in which marketing efforts in one channel will boost sales to another (Berry et al. 2010). As evidenced in Pauwels and Neslin (2015)'s research, catalogues boost revenue in both the short and long term, not only through the catalogue channel but also through the internet and retail channels. Finally, channel integration facilitates the exchange of customer data across networks, resulting in a full customer profile that maximises cross-sales opportunities (Payne & Frow 2004; Stone et al. 2002).

2.4.6 Gaps within the Context of Service Outcomes

From the above analyses, it is apparent that only a few outcomes, such as satisfaction, loyalty, customer engagement, and purchase intention have been properly conceptualised within MCIQ literature. Table 2-5 shows these outcomes and associated studies of MCIQ and provides the definitions of the outcomes:

Table 2-5 MCIQ Outcomes and Definitions

Construct	Definition	MCIQ Studies related to Constructs
Satisfaction	Customer's overall judgment regarding a product or service that provides a pleasurable level of consumption-related fulfilment.	Herhausen et al. (2015); Hammerschmidt et al. (2015); Hsieh et al. (2012); Seck and Philippe (2013); Wang, T et al. (2016);
Customer Value	The perception of net benefit against the cost associated with receiving a service.	Wang, T et al. (2016); Oh and Teo (2010); Wu and Chang (2016); (Van Birgelen et al. 2006)
Consumer Engagement	The level of a customer's physical, cognitive and emotional presence in their relationship with a service organisation.	Lee et al. (2018)
Cross-buying Intention	The total number of different products that a customer has brought from a business, calculated from the first purchase.	Li et al. (2018)
Loyalty	Commitment to rebuy or repatronise a preferred product/service consistently in the future.	Li et al. (2018); Lee et al. (2018); Wang, T et al. (2016); Hsieh et al. (2012)

From the above discussion, it is apparent that there is a scope to conceptualise other behavioural aspects as outcomes of MCIQ. According to Banerjee (2014), the measure of consumer perception on integration quality has not been addressed adequately. The following section shows customer equity as a possible outcome of MCIQ. Research has indicated the possible relation of service quality with satisfaction and consumer equity (Wang, H et al. 2016). However, there is no empirical evidence. Although multichannel integration quality has focused on a few outcomes, the relation between integration quality and customer equity has not been established properly. Moreover, customer equity consists of brand equity, value equity and relationship equity (Lemon et al. 2001; Leone et al. 2006; Rust et al. 2001; Rust et al. 2004). Thus, customer equity covers a broader domain of customer value and loyalty. Due to these reasons, there is a scope for measuring satisfaction and customer equity as MCIQ outcomes. The explanation of customer equity is provided in the following section:

2.4.7 Customer Equity and Multichannel Integration Quality

After analysing the extant literature, this research focuses on the construct *Customer Equity* and analyses its suitability as an outcome of MCIQ having satisfaction as a mediator. Customer equity is related to value creation resulting from profit, costs, cash flow, and customer relationship (Wang, H et al. 2016). It is the concept that results from maintaining a lifetime relationship with customers utilising advanced marketing technologies and maximising direct marketing benefits (Blattberg et al. 2009; Lee et al. 2014; Wang, H et al. 2016). Lemon et al. (2001) define customer equity as customer's discounted lifetime value. The fundamental understanding of customer equity is within the concept of customer lifetime value (Rust et al. 2004). Customer equity is a broader concept where customer retention, customer switching, and customer acquisition factors are involved. To capture the idea of customer equity, existing research proposes three drivers: 1. Value Equity, 2. Brand Equity, and 3. Relationship Equity (Lemon et al. 2001; Leone et al. 2006; Rust et al. 2001; Rust et al. 2004). Customer equity literature provides a comprehensive framework for understanding brand management, customer experience management and relationship management as customer equity drivers (Lee et al. 2014; Rust et al. 2004). By improving these three drivers, firms can enhance customer equity (Hyun 2009). These drivers are discussed below:

2.4.7.1 Value equity

Value equity, similar to customer perception of value is a customer's estimation of the service's usefulness centred on an evaluation of what is offered relative to what is given (Rust et al. 2004; Zeithaml 1988). Value depends on customers' requirement from the service or the product. Value equity is increased by fulfilling customers' demand and expectation from the product or service (Yuan et al. 2016). Price, convenience associated

with the service, ease of use, availability, and other factors affect value equity (Rust et al. 2004).

Within MCIQ literature, customer perceived value has been addressed by several studies (Oh & Teo 2010; Wang, T et al. 2016; Wu & Chang 2016). Wu and Chang (2016) have shown how channel integration impacts hedonic value, while Gallino and Moreno (2014) argue that channel integration would enrich the value proposition as a whole.

2.4.7.2 Brand Equity

Brand equity refers to customers' personal and intangible evaluation of the brand and has been discussed in numerous service quality literature (Ailawadi & Farris 2017; Neslin et al. 2006; Picot-Coupey et al. 2016; Verhoef et al. 2015). It is the subjective assessment of a brand choice by a consumer (Yuan et al. 2016). Developing and investing in appropriate marketing mix increases brand equity (Keller 1993; Rust et al. 2004; Vogel et al. 2008). Customer's perception of a robust, unique and desirable brand, attributes to overall brand equity (Verhoef et al. 2007). Brand equity results in customer retention, charging a premium and preference of brand over non-branded products (Yuan et al. 2016).

Research on multichannel integration covers the area of brand consideration and brand experience (Picot-Coupey et al. 2016; Verhoef et al. 2015). Neslin et al. (2006) argue that channel integration strengthens customer relationships with the brand as it helps the company to offer value-added services and customisation. Furthermore, Kwon and Lennon (2009) examine the interplay between the online and offline image of the brand and concluded that the offline image of the brand has significant effects on the online image of the brand.

Brand equity has been mentioned in a few omnichannel related articles. As omnichannel extends its scope to customer touchpoints, research on multichannel integration covers the area of brand consideration and brand experience as well (Picot-Coupey et al. 2016; Verhoef et al. 2015). Integration across channels facilitates customer relations with the brand by offering value-added product and customisation (Neslin et al. 2006).

2.4.7.1 Relationship Equity

Relationship equity refers to customer evaluation of their affiliation with the company (Hennig‐Thurau & Klee 1997). Relationship equity results in the propensity of a consumer to return to the brand regardless of rational and irrational brand evaluations (Vogel et al. 2008). Having significant value equity or brand equity may not be sufficient to hold a customer to the brand. Therefore, relationship equity is essential in these scenarios. A firm having the right brand image, and having products which provide customer value, may still lose customers due to the efforts of competitors marketing activity (Oliver 1999). Relationship equity is, therefore, the glue that binds customers to the business. It is the stickiness of the relationship that provokes customers to return to the same provider repeatedly (Lemon et al. 2001).

Within MCIQ context, few studies have shown integration as one of the critical marketing tactics to retain customers for a more extended period (Hsieh et al. 2012; Payne & Frow 2004; Van Baal 2014). Retention is the possibility of a customer staying with the same service provider, and the partnership continues (Eriksson & Vaghult 2000).

Though there are no studies on customer equity and MCIQ, the drivers of customer equity have been addressed in a stand-alone manner in a few articles. Nevertheless, within service quality literature, Wang, H et al. (2016) illustrate a significant relationship between service quality and customer equity. Using Brady and Cronin (2001)'s model of

service quality (Brady & Cronin 2001), the research provides empirical evidence of the relationship between service quality, customer satisfaction and customer equity. Wang, H et al. (2016) argue that outcome quality has the most influence on customer equity, while relationship equity impacts customer satisfaction significantly. Although the literature is significant in terms of establishing a relationship between service quality, customer equity, satisfaction and customer lifetime value, the focus of the research by Wang, H et al. (2016) is not towards multichannel services and especially not towards integration quality.

Hence, from extant literature, it seems fitting to examining the relation of customer equity and satisfaction with multichannel integration quality.

2.5 Omnichannel Marketing

The disruptive change brought by smartphone and other mobile devices (Shankar et al. 2010) is inducing customers to expect more enriched and seamless shopping experience in terms of channel scope (growing number of channels and points of contact) and focus (overall customer brand experience) (Picot-Coupey et al. 2016). Multichannel research in this sense has moved towards multichannel integration or cross-channel retailing (Bendoly et al. 2005; Cao & Li 2015) and, recently, to omnichannel retailing (Brynjolfsson et al. 2013; Rigby 2011; Verhoef et al. 2015). Recent academic studies on channel management are focusing on omnichannel, which discuss definition (Rigby 2011; Verhoef et al. 2015), dimensions (Akter et al. 2019; Lee et al. 2018; Shen et al. 2018), effects (Huré et al. 2017; Lee et al. 2018; Picot-Coupey et al. 2016; Shen et al. 2018) and strategies (Barwitz & Maas 2018; Blom et al. 2017; Hübner, Holzapfel, et al. 2016; Hübner, Wollenburg, et al. 2016) involving omnichannel management.

In academic literature, the word "Omnichannel" was first coined by Rigby (2011) to address the current and rapid proliferation of digital retailing. Furthermore, Rigby (2011) differentiates omnichannel from traditional multichannel marketing. The Latin word "Omni" or "all/universal" in English represents the countless channels that are available to marketing managers for interacting with their customers. Verhoef et al. (2015, p. 176) define omnichannel management as *"the synergetic management of the numerous available channels and customer touchpoints, in such a way that the customer experience across channels and the performance over channels are optimized"*. Social media, catalogues and direct mail, mobile devices, call centres, kiosks, televisions, gaming consoles, networked appliances, home services, location-based marketing and so on are being incorporated with the traditional online and offline channels, making retailing and service marketing more complexed and challenging. The current situation calls for marketing managers to design an entirely new channel blueprint, that enables disparate channels to be integrated into a single seamless omnichannel experience (Rigby 2011).

2.5.1 Integration Quality within Omnichannel Marketing

Omnichannel is not just simultaneous use of channels, rather the integration of all available channels within a firm is the cornerstone of omnichannel's definition (Lazaris & Vrechopoulos 2014). Levy et al. (2013) define omnichannel as a synchronised offering to provide a seamless customer experience through all the channels of a retailer. According to Brynjolfsson et al. (2013), The retail industry is moving towards more seamless customer experience, and omnichannel will reduce the difference between online and offline channels, transforming the world into a showroom without walls. Rigby (2011) specifies omnichannel experience as an integrated purchase encounter combining physical and information-rich online shopping advantages.

From extant literature, it is evident that the notion of integrated/seamless experience of using all the channels is at the heart of omnichannel marketing. Integration quality is one of the most important factors of ensuring proper implementation of an omnichannel strategy. Several studies, i.e., Li et al. (2018), Lee et al. (2018) and Shen et al. (2018) have utilised the dimensions of integration quality to identify customers' service quality perception within omnichannel context. Shen et al. (2018) have shown how integration quality dimensions proposed by Sousa and Voss (2006), i.e., channel choice breadth, channel service transparency, channel-service configuration breadth, content consistency, and process consistency influence omnichannel service usage. Likewise, Lee et al. (2018) use similar constructs to show their relation with customer engagement and positive word of mouth in an omnichannel context. Li et al. (2018) argue that cross-channel integration affects customer retention and increase customer interest in alternative products in an omnichannel context.

Saghiri et al. (2017) propose a framework for omnichannel systems addressing main building blocks and enablers to operationalise omnichannel system. Saghiri et al. (2017) argue several integration quality factors such as integrated promotion, integrated transaction, integrated pricing, integrated fulfilment, integrated customer service and integrated reverse logistics are the primary building block of the omnichannel system, which further solidifies the importance of integration quality within omnichannel marketing.

2.5.2 Showrooming and Webrooming

One aspect of the omnichannel system is the notion of showrooming and webrooming. It is not an unusual scenario anymore where customers browse in their smartphones for product review and price comparison en route to the physical stores. Showrooming is

where consumers try out the products in-store but order online after comparing price in different sites (Gensler et al. 2017; Verhoef et al. 2015). There is also the opposite of showrooming, which refers to webrooming. Webrooming denotes the act of purchasing product in-store after researching the product extensively online (Flavián et al. 2016). Traditionally, customers have used the internet through personal computers. However, the proliferation of mobile-based online channels has increased the propensity of webrooming and showrooming.

Due to its popularity, several studies have contributed to developing an understanding of showrooming and webrooming and their underlying drivers (Gensler et al. 2017; Rapp et al. 2015; Santos & Gonçalves 2019). Gensler et al. (2017) articulate factors that influence showrooming behaviour. Gensler et al. (2017) argue that average price savings, perceived dispersion in online prices, perceived gain in product quality, and waiting time for service influence showrooming intentions while online search cost and time pressure negatively affects showrooming. Rapp et al. (2015) investigate how showrooming affects in-store sales personnel performance. Santos and Gonçalves (2019) explain how information processing and uncertainty-reduction motivations help webrooming behaviours.

Although multichannel integration, cross-channel behaviour and omnichannel systems have an obvious implication on showrooming and webrooming (Verhoef et al. 2015), there are no studies which address the effect of integration quality on showrooming or webrooming behaviour.

2.5.3 Difference Between Omnichannel and Multichannel Marketing

Although both multichannel and omnichannel marketing has the basic definitions of utilising several channels of the company, there are some clear distinctions between the two.

First, the number of channel scope for omnichannel marketing is more than multichannel marketing. The range of multichannel management is generally limited to physical channels, online or stores' websites and direct marketing channels such as catalogues (Verhoef et al. 2015). Most of the studies on multichannel marketing mainly focus on these three channels (i.e., Ansari et al. 2008; Avery et al. 2012; Geyskens et al. 2002; Homburg et al. 2014; Konuş et al. 2008; Van Nierop et al. 2011; Verhoef et al. 2007). However, the advent of new technologies, especially development within mobile technologies, has brought in another disruption in the multichannel environment. The proliferation of different channels, the extent of social media, mobile and other network linked channels have changed consumer behaviour significantly (Rigby 2011). Hence, there was a requirement of addressing all these channels which did not fall within the scope of multichannel marketing anymore. Thus, omnichannel marketing within academic literature has been introduced. The scope of omnichannel is not limited to the three channels; instead, it addresses all available channels customers use (Rigby 2011; Verhoef et al. 2015). Communication media which are perceived as part of a broader channel is viewed as separate channels in the omnichannel context (Verhoef et al. 2015). For example, emails, search engines, display, websites, mobile apps, and so on, which were thought as a part of the broader online channels in multichannel marketing, are viewed as separate channels in omnichannel marketing (Li & Kannan 2014). A significant additional change is that as the conventional distinctions between channels begin to disappear, the line between different channels become blurred. According to Brynjolfsson et al. (2013), omnichannel thus involves more channels compared to the multichannel system. Companies that offer an omnichannel concept are taking multichannel marketing much further. They create a combination of online and offline strategies, integrates social media and customer review in their offerings, utilise geo-location software to get better

insights of the local markets, exploit digital capabilities and use value-added, self-service technologies in-store to provide a more personalised experience (Bhalla 2014). The concept of channel barrier in multichannel is becoming redundant in omnichannel marketing.

Second, one of the crucial aspects of omnichannel is the notion of integrated/seamless experience of using all the channels (Akter et al. 2019; Huré et al. 2017; Lee et al. 2018; Li et al. 2018; Shen et al. 2018; Verhoef et al. 2015). Earlier, firms focusing on multichannel marketing used a siloed structure of channel system where offline and online channels were addressed separately (Herhausen et al. 2015; Huré et al. 2017). This siloed approach of multichannel marketing is no longer suitable as customers frequently use more than one channel nowadays. A recent study reports that organisational silos are still the most significant barriers in creating a customer-centric business (Harvard Business Review Analytic Services 2018). Rizzi and Taraporevala (2019) argue that although digital channels are becoming widely used, the importance of physical stores and the integration of physical and virtual channels through omnichannel services is the key to enhanced customer experience. Within multichannel marketing, firms have managed channels separately with little or no integration (Verhoef 2012).

Within this context, Picot-Coupey et al. (2016) propose several differences between omnichannel and multichannel. They consider multichannel retailing as a siloed approach where channels are independent of each other, whereas the omnichannel system as a strategy where all the available channels are intermingled to provide a seamless experience in a brand ecosystem. Picot-Coupey et al. (2016) put cross-channel integration in between the two, where integration between channels is apparent, but the intensity and the number of channels is not at the level of the omnichannel system.

Table 2-6 Level of integration within multi, cross and omnichannel system. Source: (Picot-Coupey et al. 2016)

Intensity of multichannel integration

	Multichannel Retailing	**Cross-channel Retailing**	**Omnichannel Retailing**
Definition	A siloed method that is a technique which functions marketing channels as an independent entity (Yan et al. 2010).	An independent approach which incorporates multiple channels to allow customers to move and synergies across channels (Chatterjee 2010; Schramm-Klein et al. 2011)	A cohesive approach that is a strategy which manages channels as interlinked touch points to allow consumers to experience a seamless brand network experience (Brynjolfsson et al. 2013; Rigby 2011)
Key characteristics	Coexistence of channels considered independent and competitive	Deletion of channel boundaries to enhance the respective roles of the channels and reduce possible frictions when switching from one channel to another	Information and transactional touchpoints merged with a unique channel to allow the customer to move seamlessly
Channel articulation	Separation between channels	Synergies among channels	Unique channel
Position of historical channel	Dominant. With the historical channel, the added channel coexists	Integrated. With the added channel, the historical channel is reconsidered	Relative. With the historical channel, the added channel becomes a touchpoint, within a unique channel
Potential conflict between channels	Cannibalization of sales (Yan et al. 2010).	Channel influenced sales (Cao & Li 2015)	

Finally, an essential distinction between multichannel and omnichannel management is multichannel management deals with interactive channels (two-way communication), i.e., face-to-face, sales chat, and so on. In omnichannel marketing, however, the long-standing difference between two-way communication and one-way communication is becoming less apparent (Verhoef et al. 2015). Neslin et al. (2006) define multichannel as customer touchpoints, where firm and customers interact. Based on the definition, the notion of interaction limits multichannel domain into a two-way communication channel

where service is delivered and received. One-way communication medium such as TV, radio and print (advertising) are not included in the definition of multichannel marketing. However, within an omnichannel system, interactive channels are being integrated with traditional channels. For example, current promotional campaigns are facilitating customers to interact with advertisers (which was traditionally a one-way communication medium) through mobile apps while watching advertisements on television, making it a two-way communication medium. In-store promotions are incorporating digital touch screen kiosks through which customers can interact with the service provider creating a one-way promotional medium into a two-way medium. Hence, social media, C2C communication, mass media channels, i.e. TV, Radio, Print and so on are all a part of omnichannel marketing (Verhoef et al. 2015). Similarly, within the mobile system, a branded app is also regarded as a channel (Verhoef et al. 2015). Thus, a customer using laptops, tablets, and other mobile devices to make a single purchase are all considered as different channels in the omnichannel system. Customers' experience of switching within these channels are deemed necessary in the omnichannel context. As these different channels are used constantly, interchangeable, and simultaneously, integration between these channels are considered an essential facet of omnichannel marketing.

Table 2-7 Multichannel vs Omnichannel Management. Source: (Verhoef et al. 2015)

	Multichannel management	**Omnichannel management**
Channel focus	Interactive channels only	Interactive and mass-communication channels
Channel scope	Store, online website, and direct marketing (catalogue)	Store, online website, direct marketing, mobile channels (i.e., smartphones, tablets, apps), social media customer touchpoints, mass communication channels: TV, Radio, Print, C2C etc.
Separation of channels	Segregated channels without convergence	Integrated channels that operate seamlessly
Channel management objectives	Per-channel objectives (i.e., sales per channel, experience per channel)	Cross-channel objectives (i.e., overall retail customer experience, total sales over channels)

In light of the above discussion, a clear difference between multichannel and omnichannel is evident. While multichannel marketing is dealing with single-channel management objective, such as sales per channel or experience per channel, omnichannel management is coping with cross-channel goals, i.e. overall retail customer experience, total sales over channels (Pauwels & Neslin 2015) and so on. However, where the multichannel world focuses primarily on retail channels, the omnichannel system stresses the interplay between platforms and brands (Verhoef et al. 2015).

2.6 Gaps in Literature

Throughout the extant review, this study has identified numerous gaps within multichannel service quality literature. This section discusses the gaps identified in the review and summarises them in table 2-8.

2.6.1 Focus on a Single-Channel

From the extant literature, it is evident that service quality research has been focusing on examining quality dimensions using a single channel perspective. The literature of service quality has predominantly focused on a single-channel mindset where physical service quality and virtual service quality have been conceptualised incoherently. Service quality literature focuses either on physical quality (e.g. Cronin & Taylor 1992; Dabholkar et al. 1996; Frost & Kumar 2000; Grönroos 1984; Parasuraman et al. 1988; Rust & Oliver 1994) or virtual quality (e.g. Aladwani & Palvia 2002; Barnes & Vidgen 2002; Chae et al. 2002; Fassnacht & Koese 2006; Kim & Nitecki 2014; Loiacono et al. 2002; Parasuraman et al. 2005; Tan & Chou 2008; Wolfinbarger & Gilly 2003; Yoo & Donthu 2001). However, in regards to MCIQ, quality perception is not bound to a single channel, but it is formed assessing all the channels that the company uses (Neslin et al. 2006). Research indicates customers' perception of service quality does not only depend on one

single channel, rather the customer's buying decisions progress through different channels. Hence, service quality perception is also formed based on multichannel usage (Blázquez 2014; Lemon & Verhoef 2016; Montoya-Weiss et al. 2003; Sousa & Voss 2006).

Therefore, there is an opportunity to address multichannel service quality by addressing channels in an integrated manner and develop quality dimensions of an integrated channel system.

2.6.2 Lack of Service Quality Research within Multichannel Literature

Studies on multichannel services are focused on various issues such as whether a second channel should be added (Avery et al. 2012), channel preference from a consumer's perspective (Gensler et al. 2012), switching behaviour between channels (Verhoef et al. 2007), channel migration (Ansari et al. 2008; Gensler et al. 2007; Venkatesan et al. 2007; Verhoef et al. 2007), channel choice (Kumar & Venkatesan 2005; Montoya-Weiss et al. 2003), value of multichannel versus single-channel customers (Ansari et al. 2008), the allocation of marketing efforts (Kushwaha & Shankar 2008) and so on. However, the desirability, consequences and value of channel integration are the most under-investigated subjects in multichannel research (Neslin et al. 2006; Neslin & Shankar 2009; Trenz 2015; Zhang et al. 2010). Hence, conceptualising and proposing integration quality dimensions within service quality research remain untapped and a significant gap to be addressed.

2.6.3 Lack of Empirical Evidence

There remains a gap in providing empirical evidence of conceptual dimensions of integration quality in multichannel service quality research. Several studies have focused on addressing integration quality and its dimensions (Banerjee 2014; Hossain et al. 2019;

Payne & Frow 2004; Sousa & Voss 2006). However, most of the proposed dimensions remain at a conceptual level. Banerjee (2014) contributes to the theory building through qualitative investigation of integration quality dimensions using an in-depth qualitative study of a single organisation. Banerjee (2014) suggests generating scale items for a research instrument as the way forward for service quality and integration quality research. Hence, there remains a scope to explore new dimensions and even transform existing conceptual dimensions of previous studies and contribute to the overall knowledge of service quality literature.

2.6.4 Lack of Conceptual Dimensions

As discussed in section 2.3.2, few articles on multichannel integration quality have empirically tested different dimensions of multichannel service quality (i.e., Hsieh et al. 2012; Lee et al. 2018; Oh & Teo 2010; Seck & Philippe 2013; Shen et al. 2018; Wu & Chang 2016). However, most of these studies focus on only a few dimensions of integration quality. Conceptual dimensions proposed by Banerjee (2014) has not been addressed in these researches. Furthermore, there is a scope to conceptualise and test several new dimensions of MCIQ. White et al. (2013) discuss the importance of brand image integration within channels which has not been conceptualised in multichannel service quality literature. Additionally, there is a scope to conceptualise new dimensions such as privacy, security and service recovery accessibility within multichannel services.

2.6.5 The Gap Regarding Modelling Service Outcomes

There is a gap in modelling the impact of integration quality on service outcomes. Service quality literature has focused on diverse consumer perceptions due to the impact of physical and virtual quality in a separate manner. However, the measure of consumer perception on integration quality has not been addressed adequately (Banerjee 2014).

Only a few outcomes such as satisfaction (Hammerschmidt et al. 2015; Herhausen et al. 2015; Hsieh et al. 2012; Seck & Philippe 2013; Van Birgelen et al. 2006; Wang, H et al. 2016), customer value (Oh & Teo 2010; Wang, H et al. 2016; Wu & Chang 2016), loyalty (Hsieh et al. 2012; Lee et al. 2018; Li et al. 2018; Wang, H et al. 2016), and customer engagement (Lee et al. 2018) has been addressed within MCIQ. Customer equity which is a noteworthy behavioural outcome due to service quality perception (Blattberg et al. 2009; Lee et al. 2014; Lemon et al. 2001; Rust et al. 2004; Wang, H et al. 2016) has not been addressed within MCIQ literature. Research has indicated the possible relation of service quality with satisfaction and consumer equity (Wang, H et al. 2016). Hence, there is a scope for measuring satisfaction and customer equity as MCIQ outcomes.

2.6.6 Dimensionality of Construct

MCIQ has been addressed a unidimensional construct in different studies (e.g., Bendoly et al. 2005; Li et al. 2018; Wu & Chang 2016) However, Sousa and Voss (2006) and Banerjee (2014) conceptualise MCIQ as a multidimensional hierarchical construct. Hence, a renewed conceptualisation of MCIQ is required using a multidimensional and hierarchical method.

2.6.7 Fragmentation of General Terms

Studies on MCIQ are fragmented and have an overlapping definition of different constructs. These past papers have used different terms to address different dimensions of channel integration. For example, channel availability has been termed as breadth of channel choice (Banerjee 2014; Sousa & Voss 2006); channel accessibility (Hsieh et al. 2012) and flexibility of channel choice (Lee & Kim 2010). Similarly, channel reciprocity has been addressed as channel reciprocity (Lee & Kim 2010), business ties (Wu & Chang 2016) and integrated order fulfilment (Oh & Teo 2010). Content consistency (Banerjee

2014; Sousa & Voss 2006) has been addressed differently by different authors, such as two of the constructs by Oh and Teo (2010), i.e., integrated product and pricing information and integrated transaction information covers the concept of content consistency. Hence, it is essential to collaborate the findings from different research under a unified view of dimensions of channel integration and provide precise definitions of each dimension.

2.6.8 Addressing MCIQ as Omnichannel Integration

As discussed in section 2.5.1, omnichannel marketing is an extension to multichannel marketing, focusing primarily on the integration of channels. However, as addressed in section 2.5.3, there are some significant distinctions between omnichannel and multichannel marketing. Unlike multichannel marketing, the omnichannel system deals with more than the traditional online and offline channels. Omnichannel covers more channels, even communication channels such as social media, TV, radio, and so on. Several articles have addressed MCIQ from an omnichannel perspective (e.g., Lee et al. 2018; Li et al. 2018; Shen et al. 2018). These studies have used only online and offline channel to measure omnichannel behaviour. However, as omnichannel covers many more channels, just addressing it with the online and offline channel is not adequate.

Due to the nature of its complexity, this research takes the converse perspective. This research is limited to addressing factors influencing service delivery channels only. The broader perspective of communication channels and its complex relationship with service delivery as addressed by omnichannel retailing (Rigby 2011; Verhoef et al. 2015) are not the focus of this research. Integration of service delivery channels is still under-researched. This research utilises all studies related to multichannel integration, i.e. multichannel and cross-channel integration, integration quality, and omnichannel

retailing to determine factors influencing multichannel integration and service quality perception due to multichannel integration.

2.6.9 Misaligning Scope of Research

Although multichannel services cover a wide range of broader channels, most researches on MCIQ only focus on the phenomenon from the lens of only two channels, i.e., physical and website (i.e., Hammerschmidt et al. 2015; Hsieh et al. 2012; Lee et al. 2018; Oh & Teo 2010; Shen et al. 2018; Wu & Chang 2016). To generate items and test MCIQ constructs, almost all studies have used items having just the two channels. Furthermore, Lee et al. (2018) and Shen et al. (2018) use only two-channel item within the context of omnichannel integration quality. Omnichannel, in comparison with multichannel deals with much more channels (Verhoef et al. 2015). Hence, there is a significant gap in the literature in terms of generating items for survey data which truly reflects customers' multichannel behaviour. There is a scope to address integration quality using at least three specific channels, i.e., physical, web, and mobile, which addresses the current customer trend using multichannel services.

Table 2-8 summarises critical articles within service quality research and identifies the gaps that each article has. The gaps are numbered and provided below. The numbers are then indicated with each article to signify the specific gaps those articles have. This research addresses all these gaps within MCIQ literature.

Gap 1: Proposed service quality dimensions are based on single-channel; hence, not all dimensions can be addressed in a multichannel setting. (For details see section 2.6.1)

Gap 2: Proposed dimensions are conceptual. Studies do not offer empirical evidence; hence, they cannot be generalised. Generating scale items for a research instrument are

required as the way forward for service quality and integration quality research. (For details see section 2.6.3)

Gap 3: Not all conceptual dimensions of MCIQ addressed in the paper. Further dimensions of multichannel integration can be addressed. (For details see section 2.6.4)

Gap 4: Model is unidimensional. Multidimensional construct of integration quality can be conceptualised. (For details see section 2.6.6)

Gap 5: Research is not focused on service quality. These papers discuss only the strategies to develop a multichannel system. (For details see section 2.6.2)

Gap 6: More novel outcome of integration towards consumer perception can be addressed. (For details see section 2.6.5)

Gap 7: Used omnichannel context without addressing all aspects of the omnichannel system. (For details see section 2.6.8)

Table 2-8 Integration quality research gaps in multi-channel service delivery research

Author(s)	Context	Proposed Dimensions		Proposed Outcomes	Gaps with Current Study
Grönroos (1984)	Service Quality in Physical Channel Context	Technical Quality, Functional Quality, Corporate Image		Perceived Service Quality	Gap 1
Parasuraman et al. (1988)		Reliability, Responsiveness, Assurance, Empathy, Tangibles		Perceived Service Quality	Gap 1
Rust and Oliver (1994)		Functional Quality, Technical Quality, Customer-Employee Interactions		Service Quality	Gap 1
Dabholkar et al. (1996)		Physical Aspect, Reliability, Personal Interaction, Problem Solving, Policy			Gap 1
Frost and Kumar (2000)		Tangibility, Reliability, Responsiveness, Assurance, Empathy		Internal Service Quality	Gap 1
Brady and Cronin (2001)		Interaction Quality	Attitude, Behaviour, Expertise,	Service Quality	Gap 1
		Physical Service Environment Quality	Ambient Conditions, Design, Social Factors,		
		Outcome Quality	Waiting Time, Tangibles, Valence		
Sousa and Voss (2006)		Interpersonal Services	Routine, Customer Support	N/A	Gap 1
		Logistics Fulfilment	Reliability, Inventory Availability, Timeliness		
Yoo and Donthu (2001)	Service Quality in Website Context	Ease of Use, Aesthetic Design, Processing Speed, Security			Gap 1
Aladwani and Palvia (2002)		Specific Content, Content Quality, Appearance, Technical Adequacy			Gap 1
Barnes and Vidgen (2002)		Usability, Information, Design, Trust, Empathy			Gap 1
Loiacono et al. (2002)		Informational Fit-To-Task, Tailored Communications, Trust Response Time, Ease Of Understanding, Intuitive Operations, Visual Appeal, Innovativeness, Emotional Appeal, Consistent Image, On-Line Completeness, Relative Advantage			Gap 1
Wolfinbarger and Gilly (2003)		Web Site Design, Privacy/Security, Fulfilment/Reliability, Customer Service			Gap 1

Parasuraman et al. (2005)		Efficiency, System Availability, Fulfilment, Privacy, Responsiveness, Compensation, Contact			Gap 1
Fassnacht and Koese (2006)		Environment Quality	Graphic Quality, Clarity of Layout, Attractiveness of Selection		Gap 1
		Delivery Quality	Information Quality, Ease of Use,		
		Outcome Quality	Technical Quality, Reliability, Functional Benefit, Emotional Benefit.		
Chae et al. (2002)	Mobile Service Quality	Connection Quality, Content Quality, Interaction Quality, Contextual Quality			Gap 1
Tan and Chou (2008)		Perceived Usefulness, Perceived Ease of Use, Content, Variety, Feedback, Experimentation and Personalization			Gap 1
Akter et al. (2016)	Service System Quality	System Quality,	System Reliability, System Efficiency, System Flexibility, System Privacy		Gap 1
		Interaction Quality,	Responsiveness, Assurance, Empathy		
		Information Quality	Utilitarian, Hedonic		
Kim and Nitecki (2014)	Social Media Services Quality	Efficiency, System Availability, Privacy, Fulfilment			Gap 1
Sousa and Voss (2006)		Virtual Fulfilment, Efficiency, Ease of Use, Speed, System Availability, Privacy			Gap 1
Wixom and Todd (2005)	Integrated Model of System Quality and Information Quality in Website Context	System Quality	Reliability, Flexibility, Integration, Accessibility	Information satisfaction, System Satisfaction, Usefulness, Ease of Use, Attitude, Intention	Gap 1
		Information Quality	Completeness, Accuracy, Format, Currency		
Xu et al. (2013)	The 3Q Model (service quality, information quality and system quality) in	System Quality	Reliability, Flexibility, Integration, Accessibility, Timeliness	Information Satisfaction, System Satisfaction, Service Satisfaction, Usefulness,	Gap 1
		Information Quality	Reliability, Flexibility, Integration, Accessibility		
		Service Quality	Tangibles, Responsiveness, Empathy, Service Reliability, Assurance		

	Website Context			Ease of Use, Enjoyment, Attitude, Intention	
Sousa and Voss (2006)	Integrated Multichannel in General Context	Channel-Service Configuration	Breadth of Channel Choice, Transparency of Channel-Service Configuration	N/A	Gap 2,3
		Integrated Interactions	Content Consistency, Process Consistency		
Banerjee (2014)	Integrated Multichannel Within Banking Service	Channel-Service Configuration	Breadth of Channel Choice, Transparency of Channel-Service Configuration, Appropriateness of Channel-Service Configuration,	N/A	Gap 2,3
		Integrated Interactions	Transaction Data and Interaction Data Integration, Process Consistency		
Seck and Philippe (2013)		Channel-Service Configuration, Integrated Interactions		Customer Satisfaction	Gap 3,4,6
Hsieh et al. (2012)		Information Consistency, Channel Accessibility, Personal Data Integration		Channel Switching Difficulties, And Satisfaction	Gap 3,4,6
Lee and Kim (2010)	Integrated Multichannel within Retailing Context	Information Consistency, Freedom in Channel Selection, E-Mail Marketing Effectiveness, Channel Reciprocity, Appreciation of Store-Based Customer Service		Loyalty Intention	Gap 3,4,5,6
Oh and Teo (2010)		Information Quality	Integrated Product and Pricing Information, Integrated Transaction Information, Integrated Promotion Information	Customer Value	Gap 3,6
		Service Convenience	Integrated Information Access, Integrated Customer Service, Integrated Order Fulfillment		
Oh et al. (2012)		Integrated Product and Pricing Management, Integrated Transaction Information Management, Integrated Promotion, Integrated Information Access, Integrated Customer Service, Integrated Order Fulfillment		Exploitative Competence, Explorative Competence, Firm Performance	Gap 3,4,6

Saeed et al. (2003)		Informational Integration; Content Integration; Logistical Integration		Gap 2,3,5
Wu and Chang (2016)		Transparency of service configuration, Information consistency, Business ties, Process consistency	Online purchase intention, Online monetary savings, Online hedonic value	Gap 3,4,6
Van Baal (2014)		Harmonisation	Cross channel customer retention, cannibalisation,	Gap 3
Emrich et al. (2015)		Channel Integration (Full, Asymmetrical, None)	Perceived Variety, Perceived Risk, Perceived Convenience, Patronage Intentions	Gap 5
Madaleno et al. (2007)	Multichannel B2B	Cross Channel Consistency, Channel Choice	Customer Satisfaction	Gap 3,4,6
Pantano and Viassone (2015)	Single Channel Quality in Multichannel Retailing Context	Store atmosphere, Channel availability	Satisfaction, Attitude, Purchase Intention	Gap 3,4,6
Bapat and Bapat (2017)		N/A	Satisfaction, Loyalty	Gap 3,5,6
White et al. (2013)		Design factors, Ambient Factors, Social Factors	Retailer Brand Equity	Gap 3,5,6
Yu et al. (2011)		Perceived Channel Quality: Perceived Service Quality, Perceived Merchandise Quality, Perceived Channel Price: Perceived Monetary Price, Perceived Non-Monetary Price Perceived Channel Value: Perceived Hedonic Value, Perceived Utilitarian Value	Channel Usage Intention (Information search, Multichannel shopping)	Gap 5,6

Hammerschmidt et al. (2015)		Choice, Charge, Convenience, Confidence, Care,		Overall Satisfaction	Gap 3,4,6
Li et al. (2018)	Channel Integration within Omnichannel Retailing Context	Channel-Service Configuration	Breadth of channel service choice, Transparency of channel-service configuration	Customer Engagement, Repurchase Intention, Positive Word-of-Mouth	Gap 3,6,7
		Integrated Interactions	Content consistency, Process consistency		
Lee et al. (2018)		Channel integration		Customer retention, interest in Alternatives, Retailer Uncertainty, Identity Attractiveness, Switching Cost	Gap 3,4,6,7
Shen et al. (2018)		Service Configuration Quality	Channel Choice Breadth, Channel Service Transparency	Channel Usage Intentions	Gap 3,6,7
		Integrated Interaction Quality	Content Consistency, Process Consistency		

2.7 Conclusion

The principal objective of this chapter was to examine the current multichannel service quality literature in an interdisciplinary manner to synthesise the results and discrepancies. This analysis forms the basis for the design of the research model in the next chapter. The findings clearly indicate that MCIQ is a hierarchical, multidimensional and context-specific construct that clearly affects critical service outcomes, i.e. satisfaction and customer equity. While the literature review also recognises service quality as essential in multichannel systems, there is a lack of research that has properly conceptualised MCIQ's components and implications. Overall, the literature review in the study describes several key findings and discrepancies that solidify the basis for exploratory research (Chapter 3) and the research model (Chapter 4).

Chapter 3: Exploratory Analysis[3]

3.1 Overview

This chapter presents the exploratory analysis through a systematic literature review and qualitative analysis to conceptualise dimensions of MCIQ. The chapter presents the method used for thematic analysis and qualitative analysis, the sampling plan for qualitative analysis, data-collection methods, and results. This exploratory study aims to analyse the factors that influence multichannel integration quality.

The goal of this chapter is to explore the themes of MCIQ by conducting a systematic literature review. Furthermore, this chapter discusses the qualitative analysis used to confirm the themes/dimensions of MCIQ and explore new dimensions of MCIQ. Using thematic analysis and qualitative findings from this chapter, this research proposes a conceptual model of MCIQ in Chapter 4.

The current chapter is arranged into various sections. Section 3.2 discusses the method of a systematic literature review or thematic analysis. Section 3.3 explains the results of the thematic analysis. Section 3.4 describes the qualitative technique, types of the qualitative method used in this research, sampling plan and justification of the qualitative analysis. Finally, section 3.5 discusses the overall findings of the exploratory study using results from the qualitative analysis.

[3] An abridged version of this chapter was published in the following journal:

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3.2 Thematic Analysis

In the previous chapter, this research discussed the definition of MCIQ and several MCIQ dimensions that has been proposed in service quality literature. This section conducts an exploratory analysis to conceptualise dimensions and sub-dimensions and explore new dimensions of MCIQ. To conduct the exploratory analysis, this research first conducts a thematic analysis based on a systematic literature review related to integration quality in the domain of multichannel service delivery. Thematic analysis is defined as "*a method for systematically identifying, organizing, and offering insight into patterns of meaning (themes) across a data set"*(Braun & Clarke 2012, p. 57). The thematic analysis is a flexible method that helps the researcher to focus on the data in many respects. Researchers can genuinely concentrate on interpreting context throughout the entire data set with thematic analysis, or they can analyse in detail one specific aspect of the research. Researchers can investigate the evident or semantic meanings in the data, or they can question the underlying implications, hypotheses and ideas behind what is stated (Braun & Clarke 2006). Thematic analysis fits a wide range of research questions and topics as it can be done in various ways (Braun & Clarke 2012).

Accessibility and versatility are the two key reasons to use thematic analysis (Braun & Clarke 2012). The thematic analysis presents an entry into conducting qualitative research that otherwise may seem ambiguous, perplexing, conceptually challenging, and complex (Braun & Clarke 2012). Owing to its theoretical flexibility, the thematic analysis provides a versatile and useful research tool that can effectively provide detailed and rich data (Braun & Clarke 2006). The accessibility as a process often fits the work carried out by research teams using multimethod research techniques (Braun & Clarke 2012).

Due to the nature of this research, where literature on multichannel service quality is extremely fragmented, the use of thematic analysis is appropriate. It is a method that is used to provide a solid foundation for understanding the complex nature of MCIQ. Furthermore, as the thematic analysis is used in multimethod research, this research focuses on thematic analysis as a basis for further qualitative and quantitative research.

This research explores integration quality on multichannel services and embraces a systematic approach to ensure completeness throughout the review. This study follows the approach used by Ngai and Wat (2002), Vaithianathan (2010) and Akter and Wamba (2016) in e-commerce research. The systematic review considers a search timeframe from 2003 to 2018. The boundary is set to 2003 as service quality literature prior to 2003 primarily focused on single-channel context. A database search combining the keywords: 'integration' and 'quality' with the terms 'multichannel marketing', 'multichannel services', 'multichannel retailing' and 'cross-channel' was conducted. Additionally, separate searches using the terms 'multichannel service quality' and 'omnichannel' were performed.

The following online journal databases were searched for scholarly peer-reviewed journals, periodicals, and quality web content related to multichannel integration from 2003 to 2018:

- ABI/INFORM Complete.
- Business Source Complete.
- EBSCO Open Access Journals.
- ScienceDirect.

These four databases are the most important and widely used, consisting of top-ranked journals within the business and social science disciplines. One hundred five papers were downloaded and reviewed for the systematic review. A quality appraisal was conducted to capture the maximum number of views on integration in multichannel services to ensure clarity of the papers' contributions to the research question (Birnik & Bowman 2007). At this stage, 76 articles were identified. Cross-referencing yielded nine more articles that were suitable for inclusion. Finally, five more papers were included manually making the final list of 90 papers. Overall, the conditions used to select each article confirmed an explicit or implicit indication of integration in multichannel services. To produce the thematic analysis of the literature review, this research followed the process explained by Braun and Clarke (2006). These steps are described in table 3-1.

Table 3-1: Phases of Thematic Analysis Adopted from Braun and Clarke (2006).

Phase	Process overview
Familiarizing yourself with your data	Transcribe data, read and re-read data, and record initial ideas
Generating initial codes	Coding of interesting data attributes throughout the entire data set in a structured manner, collecting data specific to each code
Searching for themes	Collection of codes into prospective themes, collection of all relevant data for each theme
Reviewing themes	Checking whether the themes work regarding the coded excerpts (Level 1) and the whole set of data (Level 2), creating a map of the analysis
Defining and naming themes	Continuous analysis to refine the nuances within each theme, creating clear definitions and titles for each theme, and the main narrative the study tells
Producing the report	The last opportunity to analyse. Collection of lively, convincing descriptions of excerpts, the final examination of chosen extracts, linked back of the study to the issue of science and literature, creating a comprehensive scholarly report.

3.3 Results of the Thematic Analysis

Four codes or themes/dimensions were generated from the extensive literature review. The review of 90 articles indicates nine sub-dimensions of MCIQ, which were placed under four themes. The first dimension is *channel-service configuration* which consists

of three sub-dimensions, i.e., *breadth of channel choice, transparency of channels,* and *appropriateness of channels*. The second dimension is *content consistency* which consists of two sub-dimensions, i.e., *information consistency* and *transaction data integration.* The third dimension is *process consistency,* which consists of two sub-dimensions, i.e., *system consistency* and *image consistency.* The fourth dimension is *channel reciprocity,* which includes *integrated order fulfilment* and *integrated information access*. Through thematic analysis, image consistency and system consistency have been identified as essential sub-dimensions of process consistency. Prior studies on MCIQ have not addressed sub-dimensions of process consistency separately.

To validate the reliability of the analysis, this research estimated Krippendorff's alpha (or, Kalpha) (Krippendorff 2004). Krippendorff's alpha (α) is a coefficient of reliability used to measure reliability irrespective of observer numbers, missing data, sample size or levels of measurement (Krippendorff 2011). It is used to calculate or allocate computable values to the consensus between observed coders, judges' raters or measurement instruments discriminating between usually unstructured phenomena.

This research used the procedure shown in the manual by De Swert (2012) and SPSS macro produced by Hayes and Krippendorff (2007) to calculate Kalpha. Four judges analysed the themes and sub-dimensions indicated in the articles. IBM SPSS 25 was used to calculate the inter-rater reliability of coded variables (Hayes & Krippendorff 2007). The calculated Kalpha value was 0.83, which is above the cut off value of 0.80 (De Swert 2012), showing evidence of reliability in content analysis.

Table 3-2 summarises the finding of the thematic analysis and indicates the conceptualised dimensions according to different studies addressing specific dimensions.

Table 3-2: Literature Related to Multichannel Integration Quality Dimensions.

		Channel-Service Configuration			***Content Consistency***		***Process Consistency***		***Channel Reciprocity***	
Author(s)	***Context***	*Breadth of Channel Choice*	*Transparency of Channels*	*Appropriateness of Channels*	*Information Consistency*	*Transaction Data Integration*	*System Consistency/ Ease of Use*	*Image Consistency*	*Integrated Order Fulfilment*	*Integrated Information Access*
Sousa and Voss (2006)	*Integrated Multichannel in General Context*	×	×		×	×	×	×		
Banerjee (2014)	*Integrated Multichannel within Banking Service*	×	×	×	×	×	×	×		
Seck and Philippe (2013)		×	×		×					
Hsieh et al. (2012)		×			×	×				
Bendoly et al. (2005)	*Integrated Multichannel within Retailing Context*		×		×				×	×
Lee and Kim (2010)		×			×				×	×
Oh and Teo (2010)					×	×		×	×	×
Saeed et al. (2003)					×				×	
Wu and Chang (2016)			×		×			×	×	
Berman and Thelen (2004)					×	×			×	×
Madaleno et al. (2007)	*Multichannel B2B*	×	×		×	×		×		

Pantano and Viassone (2015)	*Single Channel Quality in Multichannel Retailing Context*	×						×		
Bapat and Bapat (2017)							×			
White et al. (2013)					×	×	×	×		
Kim et al. (2005)							×			
Yu et al. (2011)									×	
Hammerschmidt et al. (2015)							×			
Yong-zhi (2014)			×		×		×		×	
Kwon and Lennon (2009)								×		
Li et al. (2018)	*Channel Integration within Omnichannel Retailing Context*					×			×	×
Lee et al. (2018)		×	×		×		×			
Shen et al. (2018)		×	×		×		×			

3.4 Qualitative Analysis

To build on the findings of thematic analysis and extend the limited knowledge of multichannel integration quality, this study conducted a qualitative analysis. The qualitative research in this phase included twenty semi-structured in-depth interviews and two focus group discussions (n=18) that enabled to catch the cognitive framework of consumer expectations of integration quality and determine how contextual information becomes integrated with their mental models concerning the use of multichannel services. The initial phase of the research used exploratory research using method suggested by Zikmund et al. (2013) to explain the concepts and provide a detailed understanding of the context for the researchers (Churchill & Iacobucci 2006).

In this study, qualitative research is used to:

a) Confirm the dimensions of MCIQ which were identified through the literature review.

b) Identify new dimensions of MCIQ.

3.4.1 Semi-structured In-depth Interviews and Focus Groups

An in-depth interview is described as a collection of one-to-one questions that a qualified interviewer asks to get an understanding of what the respondent thinks of something or why he or she does something in a specific manner (Burns & Veeck 2017). There are several types of interviews, including structured interviews, semi-structured interviews and unstructured interviews which can be placed in a continuum (Hay 2000).

Structured interviews are often called standardised interviews. It follows a list of questions set or uniform questions. The questions usually arrive in precisely the same

order (Corbetta 2003; Hay 2000). Questions are typically specific, and the respondent is often given a fixed set of answers (these kinds of questions are also called a closed-ended, pre-coded or fixed-choice questions).

At the opposite end of the continuum are unstructured forms of interviewing. In these interviews, there are no sets of questions (Hay 2000). This is a non-directed type of interview and is a flexible method. This is more casual than other forms of interviews. Interviewees are encouraged to speak in a frank, open manner and give as much detail as possible. The interviewer does not require training or coaching on the process of the interview. The interviewers ask questions encouraging respondents to express their opinions, information and share their experiences (Corbetta 2003).

In the middle of this continuum are semi-structured interviews. This type of interviewing is predefined in some degree, but still maintains flexibility in the way the interviewer addresses the issues (Hay 2000). The researcher must include a description of the key topics, issues and queries. In this type of interview, the sequence of the questions may be modified, depending on the direction of the interview. Although an interview guide is used, it is possible to ask further questions. This method of interview offers the investigator the ability to evaluate the views and opinions of the interviewee. Probing questions are asked to discover new directions or topics not originally thought (Gray 2013).

On the other hand, a focus group is a review of the topic with a small group of respondents, having between 6 and 12, which is led by a moderator who conducts the discussion in a non-structured and natural way (Malhotra 2014). The facilitator or focus group moderator maintains the group on the topic but is otherwise non-directive, so that the group may discuss the issue from different perspectives. A crucial aspect of a focus

group is the interaction between members of the group (Cameron 2005; Morgan 1996). This distinguishes focus groups from semi-structured interviews as the latter is based on the interaction between interviewer and interviewee. This research followed the procedure of conducting a focus group, as suggested by Malhotra (2014).

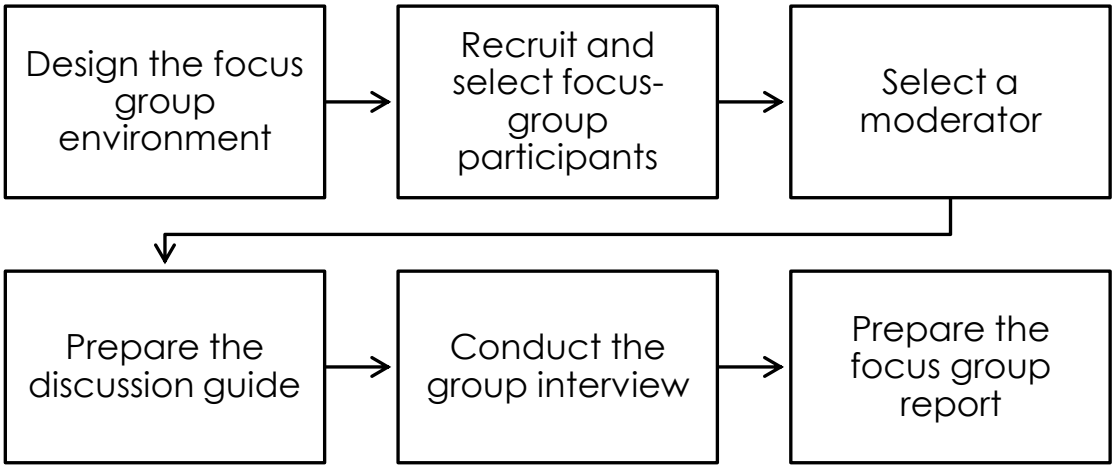

Figure 3-1 Procedure for conducting a focus group. Source: (Malhotra 2014)

This research chose to conduct both semi-structured in-depth interviews and focus group discussions as these can be used as 'stand-alone methods' or as a complement to other methods enabling the means for multi-method research. Furthermore, both focus groups and semi-structured interview assists in analysing a concept from different perspectives or sources (Valentine 2005, p. 112). Similarly, researchers may try to maximise their knowledge of a research topic utilising multiple methods or different sources. For these purposes, both semi-structured in-depth interviews and focus group discussions are essential. Likewise, focus groups are helpful for researchers who want to focus on and explore a new field (Greenbaum 1998; Morgan 1996). Thus, to explore the new concept of multichannel service quality, to confirm the existing dimensions and identify new

dimensions of MCIQ, this research chose to conduct semi-structured in-depth interviews and focus group discussions.

A report including the questions for the study was made and approved by the University of Wollongong's Human Research Ethics Committee (HREC) before the qualitative study started (see Appendix 1).

3.4.2 Sampling

Based on the objective of the qualitative analysis, interview and focus group participants were selected using a convenience sample for this study. Since this current study focuses on factors affecting MCIQ, the unit of analysis is inherently at an individual level. The selection criteria included customers who hold a banking account in Australia and have used three specific channels of the bank, i.e., mobile app, website and physical branch within the last three months. This criterion ensures that the participants have a good perception of using multichannel of a service provider, hence, will be able to provide valuable insights regarding factors influencing the quality of using multichannel. All the participants held consumer banking accounts within Australia. Some participants also had business banking accounts, mortgage accounts and other loan accounts with various banks in Australia. Overall, participants' age ranged from 20 – 58 years old and were 42% female and 58% male.

The approach in this study phase is confirmatory (deductive). Therefore, a semi-structured approach to the questions was adopted. The questions were based on each construct, including the new constructs of assurance quality and value of the MCIQ model.

3.4.3 Coding and Mapping

The interviews and discussions were recorded, transcribed and examined using Nvivo and manual thematic analysis (Dagger et al. 2007; Lincoln & Guba 1985). The steps of the qualitative analysis included, firstly, to highlight the primary responses of the interviews in the transcripts. Secondly, to identify the primary dimensions of MCIQ based on the responses. Finally, to identify the recurring themes under relevant primary dimension. The excerpts were analysed by two academic judges to calculate inter-rater reliability using Nvivo and Microsoft Excel. The inter-rater reliability was 0.82 passing the cut-off point of 0.70 (Straub et al. 2004).

3.5 Results of the Qualitative Study

The qualitative analysis further confirmed the identified dimensions and sub-dimensions of MCIQ. In addition, the qualitative phase identified two new sub-dimensions: *privacy & security* and s*ervice recovery accessibility* as factors influencing MCIQ. These sub-dimensions represent the dimension of *assurance quality* according to the qualitative data analysis. These dimensions have not been addressed within multichannel service quality to-date.

On the contrary, through the qualitative analysis, this research identified that in the context of banking services, the dimension: channel reciprocity and its sub-dimensions integrated order fulfilment and integrated information access have little or no importance. Channel reciprocity which enables business support such as logistical support or information access of offline stores for products purchased in online stores and vice versa (Lee & Kim 2010) is applicable in the retail industry. In the service industry, the application of channel reciprocity is limited. Therefore, this study excludes the analysis of channel reciprocity in the MCIQ model.

Overall, the findings of the thematic analysis and qualitative data analysis show that MCIQ consists of four dimensions and nine sub-dimensions.

Throughout the analyses, MCIQ has been found to be a higher-order multidimensional construct. Based on the findings of the thematic analysis, systematic literature review and qualitative findings, a model of MCIQ along with its dimensions and sub-dimensions is proposed (see Figure 3-2) and discussed in Section 3.5.

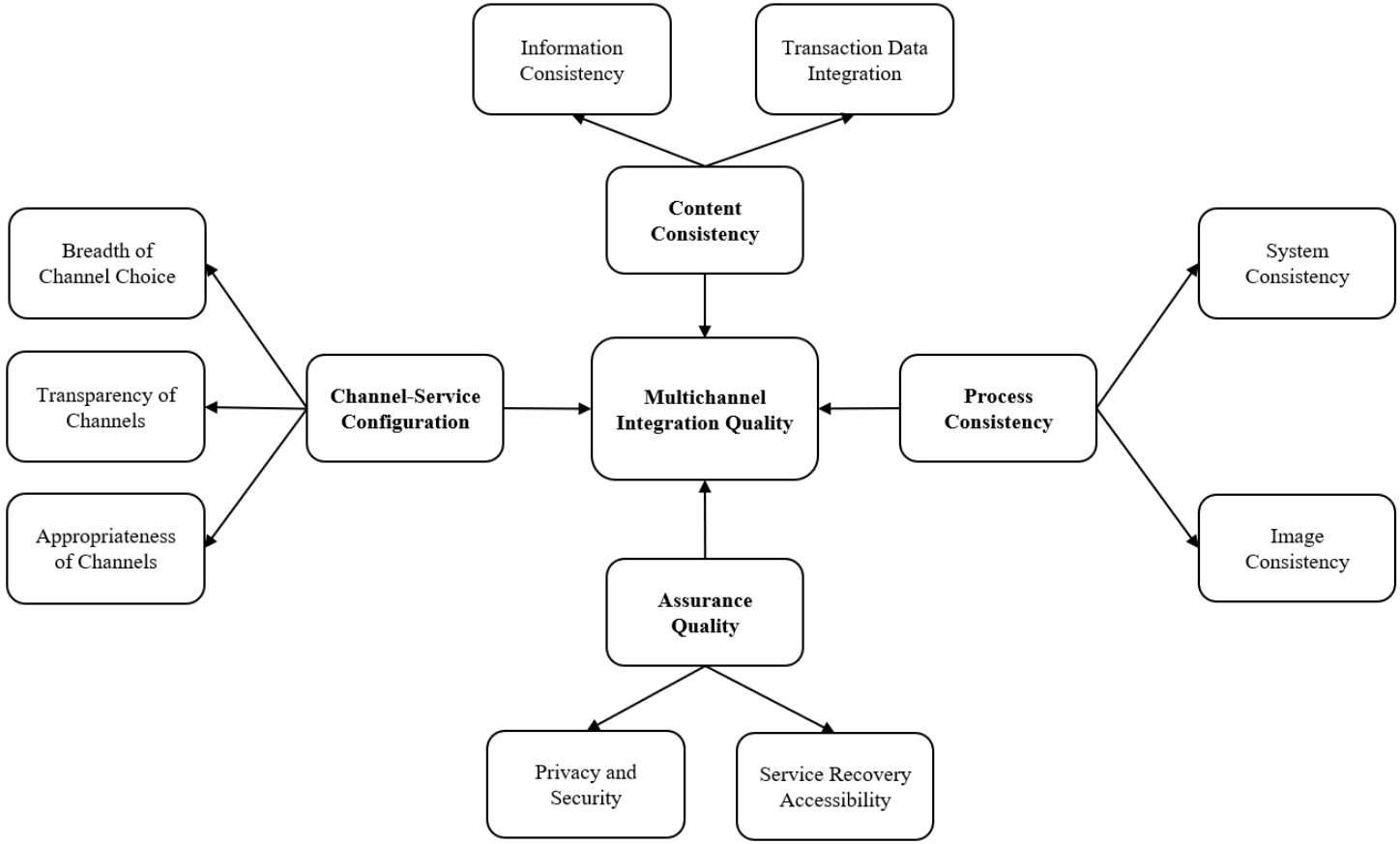

Figure 3-2 Dimensions of Multichannel Integration Quality (Exploratory Stage)

3.5.1 Channel-Service Configuration

Channel-service configuration refers to the ability to perform the same service using different channels of the firm and to have the same level of consistency and quality level (Banerjee 2014). The analysis of literature on service quality has identified several factors, i.e., *breadth of channel choice, transparency of channels, and appropriateness of channels* as sub-dimensions of channel-service configuration.

3.5.1.1 Breadth of Channel

Breadth of channel refers to the degree to which customers can choose among alternative channels to perform the same task (Lee et al. 2018; Sousa & Voss 2006). It is the firm's offering of different channels for customers to freely search, purchase, arrange delivery and receive customer service from (Lee & Kim 2010). Compared to firms offering only a single channel, customers prefer firms offering multiple channels to avail services from (Lee et al. 2018).

Interview respondents indicated the following regarding breadth of channel choice:

… I guess one of the main advantages is convenience, like withdrawing money. If you are around at the supermarket and you happen to not have your wallet with you, you can still walk to the nearest ATM and withdraw money using cardless cash, so that's pretty cool. Even if you are out and about, if you are shopping and all of a sudden you need to pay rent or whatever, you don't have to go home and log into your computer. You can do it on your mobile phone. So, that is pretty convenient. So, having all these different channels, to me personally as a consumer, I think it is useful because it's convenient. (Interviewee # 13, Male 30s).

... I think with the channels that I am using now, I am pretty happy with them because I can access my funds anytime anywhere. Even some of the features that you got on your mobile app, say for example if you haven't got your wallet with you, don't have your card with you, you can still withdraw money, so that is useful. (Interviewee # 13, Male 30s).

... As far as I understand, they (the bank) obviously do provide ATMs; they partner with other banks as well to provide their ATM services well. They deliver their service through the app and the online store as well. They don't have as many branches as they did before. But that's because of the common strategy that we see in the banks these days, that they are moving away from the bricks and mortar store platform and more into digital platform because they obviously cost less to maintain a digital platform, but the reach is bigger. But recently what I've started to see is that they are delivering these services more through the online platform obviously little through the app as well and also, they have sort of improved their customer service, phone numbered the hotline, so lot of the times I'll call them instead of visiting the store for some issues. So, bank really focuses on four key delivery factors which is just ATMs, the mobile app, the online platform and also the phone services, and I feel it covers my banking needs. (Interviewee # 4, Male 20s).

From the above excerpts, it is apparent that having multiple channels available to customers is essential. Customers find it convenient to be able to use any channel of their choice to perform the same task. Overall service quality of using multichannel services depends on the number of channels available to the customers. Customers use the channels which they prefer the most for given circumstances and even combine two or more channels to avail one service.

3.5.1.2 Transparency of Channels

Transparency of channels refers to consumer awareness of the available channels of a firm and services offered through those channels (Shen et al. 2018; Sousa & Voss 2006). It is the firm's effort to inform customers about different channels and service capability of each channel (Hsieh et al. 2012; Sousa & Voss 2006; Wu & Chang 2016).

Respondents indicated the following regarding transparency of channels:

… When we open the account, on the day they (bank tellers) tell you what sort of banking you can do. So, they will explain to you like they did to me and they do to everybody else, services that you can perform online, you set your online password on the bank, then you can change afterwards. You set your phone banking password, and they send you the debit or credit card which you can use in any of the ATMs or in the branches. So, it's basically on the day you open the account; they show you the ways of banking you can do with them. It was helpful. It was good enough. (Interviewee # 5, Male 20s).

… For me it is important, cause when I came in first, I had to deposit quite a lot of money, so I wasn't aware about the services, someone came and asked what I am here for, I told her I would deposit money, she showed me the machine. It was completely a new thing for me. I was carrying so much cash, it was a little bit risky for me, right at that moment, yes I took a little bit of time, to understand how the machine works, and I had deposited it, and maybe immediately I didn't get the notification, I was waiting for some time, then I asked the lady that is it ok. How will I understand it has been deposited? Then she showed me how I get a notification in the mobile app. So that was helpful using ATM and mobile app to deposit money. (FGD 2)

The above two excerpts indicate that the service provider takes several measures to inform customers about their different channels and channel features, specifically when customers start their transactions with the service provider. These strategies are perceived as helpful by customers.

Furthermore, respondents talk about specific channels and how information and promotional techniques related to those channels helped them understand the service of the provider. For example, respondents discussed the ways the mobile app was promoted:

… Other than that, the way the bank informed, like let's say I was online banking a lot. So, whenever I log in, either from my phone or from my laptop, most of the time the laptop, it comes up with the option that you can use the app. And there are different tips and tricks and plus the advertisements. They make it really attractive to make you use the app rather than going online. (Interviewee # 18, Male 40s).

On the other hand, service providers also informed the service capabilities of their website:

… But when I went there, the lady said "Yes, you can do it online as well, you can change the address anytime you want. Even hundred times you can change it." I didn't know that I can do it without going to the branch but then the lady said that look you don't have to come; you can do it online as well. (Interviewee # 8, Female 30s).

These excerpts show that transparency of channels or informing customers about channels and channels attributes are essential to determine multichannel service quality for customers. Firms can utilise different campaigns to make customers aware of available channels, which in turn will lead to increased channel usage intention (Shen et al. 2018).

3.5.1.3 Appropriateness of Channels

Banerjee (2014) extends the work of Sousa and Voss (2006) by proposing appropriateness of channels as a dimension of MCIQ. Banerjee (2014) argues that although having different channels to perform services is convenient, firms must ensure that the channels through which services are delivered are appropriate for providing that service. For instance, banking customer may perceive call centres as an inappropriate channel to sell bank loans, as call centres may not be prepared to answer technical questions related to the loan product (Banerjee 2014).

Respondents shared similar view when asked about the appropriateness of channel for specific services:

… I don't think I would feel completely okay with applying for a home loan through online or call centres. I guess, well personally, when you talk about home loans and things like that I would prefer to sit down and talk with a physical person and going through the different conditions of terms and the financing packages. I guess it really depends on the situation as well as the nature of the transaction. (Interviewee # 13, Male 30s).

… When we apply for credit cards like lot of times, the banks approve us online. They say it's conditionally approved you have to submit a certain document like payslips or your contract to get it approved. So, when we do that online they don't ask you exactly what they need in one go. Say they ask you for the payslip. When you give them, the payslip they ask you something else. So, in that case, I feel comfortable to go to the branch. So, in online they are just wasting your time because whatever they ask you even if you submit all, say next couple of days they are going to ask you something else. So basically, they don't approve you straight away. You go to the branch you give them the payslips or whatever they need they can approve you on the spot. But that's been my personal

experience. When you apply credit cards online, it's a waste of time. (Interviewee # 5, Male 20s)

These excerpts indicate that customers judge channels according to their service capabilities. Having inappropriate channels for services causes waste of time and loss of trust from a customer's perspective.

Furthermore, some respondents showed their concern of enforcing customers to use certain channels:

... I will go into a branch, and I will see elderly, especially on pension day, where they would line at the tellers, and the tellers are guiding them to the self-service machines, and they are just getting frustrated because they don't know how to use it. (Interviewee # 12).

... So that's one thing I think they should improve like not only think commercially they have to think all different sort of age group as well. (FGD 2)

... It is easier, but I also like, and I did mention before that I still do find that they try and cut down on the tellers and... you know especially banking. Like you might want to just deposit money or do this, but at the same time, you might want to ask them about something else. Like how's my account going but when they force you to sort of use an ATM, you kind of lose that connection. You use the ATM but you don't want to go in line for the questions you had anymore. So, it ends up being a bit of a hassle, but you sort of deal with it. (Interviewee # 17, Male 30s)

... But I think they should keep a balance between online services and physical store. They are not keeping that. They are more focused on the online services and they are

ignoring the fact that some people don't know like are not good with online services, are not good with technology. (FGD 1)

It may seem lucrative for the firms to offer specific service through a specific channel. However, as indicated above, firms should not force customers to use channels which are inappropriate for the service.

3.5.2 Content Consistency

Content consistency refers to the consistency and integration of outgoing and incoming information through different channels between the customers and the firms (Lee et al. 2018; Sousa & Voss 2006). Sub-dimensions of content consistency are *information consistency* and *transaction data integration*.

3.5.2.1 Information Consistency

Information consistency refers to the degree where information transmitted from the firm is uniform within all the channels (Banerjee 2014; Oh & Teo 2010). Customers expect information regarding product descriptions, price, assortment details, delivery details, and promotions are consistent within all channels (Wu & Chang 2016).

From interviews, respondents indicated:

... Most important thing is that information has to be integrated because if one channel gives you a different answer to the other one, that is when you start thinking which is reliable, which one should you go to. You wouldn't want that, given the fact that it is about your funds and savings, so that is definitely something you wouldn't want, you would want transparency and you would want them to be consistent across all the channels you are dealing with. (Interviewee # 7, Female 20s).

... I guess it is very important for the information to be consistent, for what you are talking with the tellers of the bank needs to be consistent with if you ring up the bank or go online to search. Yeah, so that is crucial, I think, otherwise if you go to a branch and they are giving you information that is different from what you are accessing online, where will you find the real information? So that becomes a question. (Interviewee # 7, Female 40s).

... Service providers need to know all the facts. That whatever I am asking online the answers that I am receiving from online or website I am getting the same answer when I am calling someone over the phone. Again, when I am at the physical branch, I am getting the same answer. So, if all the services are provided through all the channels, then synchronisation is needed. (FGD # 2).

The above statements show consistent information through all the service delivery channels of the firm is associated with reliability. Inconsistent information within channels reduce trust and frustrate consumers (Hsieh et al. 2012; Rangaswamy & Van Bruggen 2005).

3.5.2.2 Transaction Data Integration

Transaction data integration refers to collecting, analysing, integrating and utilising customer data such as search, purchase, order, delivery, special request, demographic profile and so on through different channels (Oh & Teo 2010; Sousa & Voss 2012). This strategy will ensure a consistent service across multiple channels while enabling multichannel firms to cross-sell and provide personalised offers at an individual level (Godfrey et al. 2011).

Interviewees shared their frustration as some banks are lacking behind regarding integrating transaction data within a reasonable timeframe:

... When my wife was overseas in India. She had a supplementary card, and she was spending money. She asked me while she was spending the local currency of the country "can you check how much Australian dollar was spent?" She was asking to know the exchange rate. I couldn't tell her even in a week's time. It was not updated anywhere, neither online nor through the mobile app. Then I had to finally call the manager and ask about the amount of money spent and the exchange rate. So, I don't think those channels are integrated in terms of different services I have. So obviously, when you don't get this information that you require, you feel frustrated. I think they are inefficient. (Interviewee # 2, Male 50s).

While other banks were extremely good at integrating transaction data, and respondents were satisfied:

... Yeah, I can track what sort of purchases I made using my credit card and it is updated almost instantaneously. I find it really convenient as my balance in mobile app is updated as soon as I make any transaction through EFTPOS or online. (Interviewee # 15, Female 30s).

Furthermore, respondents were also satisfied as some banks are using transaction data to offer personalised services:

... Yeah like I do banking with Commonwealth a lot, and I'm using their credit card for a while. So, from the bank they have contacted me and said – "because you're using a lot the credit card you should change to an award card while you only pay $60-$70 a year, but in return you will get 3 or 4 times whatever you're paying as the annual fee." So, they have calculated what I'm going to get, so I've transferred to award card so that it's pretty helpful for me. (Interview # 5, Male 20s).

... Like your superfunds, as opposed to being managed by an external entity, you can even have your super funds managed by your bank. I think having all my services being managed by the same person; personally, I think that's a lot more convenient for me, and I can access the information more easily as opposed to going to different people for different pieces of information. So, I think for me, I'm probably a person who is really demanding in terms of convenience. So, I can save time if I don't have to travel far, if I don't have to leave work to do something then if I can do everything in my desk in my fingertips, then that's great for me; as opposed to picking up the phone to ring this person to find more about my superfunds balance or what's happening to my superfunds and ring this other person to find out more about my home loans and mortgage. Having everything managed by one single entity, that's one of the key things important to me. (Interviewee # 13, Male 30s).

From the interview data, it is evident that firms should focus on collecting real-time customer data and integrating it within all its channels. Customers look for convenience. They want firms to provide them personalised offers from which they can easily select the best product or service option, thus, reducing the hassle of researching all the products and service by themselves. Customers also look for convenience by being able to manage services through one channel. Research indicates that proper utilisation of real-time customer data leads to enhanced firm performance (Fosso Wamba et al. 2018).

3.5.3 Process Consistency

Process consistency refers to the consistency of front-office processes associated with different channels (Sousa & Voss 2006). Indicators of process consistency include the service's feel, waiting times and employee discretion level (Banerjee 2014; Sousa & Voss

2006). This research has identified two sub-dimensions of process consistency; namely, *system consistency* and *image consistency.*

3.5.3.1 System Consistency

System consistency refers to customer perception of convenience, ease of use, and consistency considering the technical issues of service delivery processes within all the channels (Akter et al. 2016; Delone & McLean 2003). It is related to ensuring consistent system quality (Akter et al. 2016) within the channels. System quality is associated with navigation, search, order, payment, delivery, and return. In the offline context, it is the store layout and design, convenience of finding products, ease of payment and other tangibles (Kim et al. 2005; Parasuraman et al. 1985), while in an online context, it is related to website or mobile app functionality, layout, flow, and payment facilities (White et al. 2013).

Regarding the importance of system consistency, interview respondents indicated:

... Absolutely, with all processes, it needs to be you know efficient and needs to be done in a timely manner. Whether you do to a physical branch or online, it doesn't matter, I guess it needs to be efficient, and it is safe and will be done in a timely manner. (Interviewee # 12, Female 40s).

... Internet wise, it's very easy, it's very straightforward. The mobile banking is also very easy to use, they explain the key steps in very simple terms. And also, the physical channel, as soon as you walk in there, someone greets you, and you are being directed to the next available counter; so, in a way, I think they have taken really good care of me as a customer. They try to make things not so complicated for me, easier to manage for me,

which I do appreciate which is why I'm still with the bank that I've been with for the past few years. (Interviewee # 13, Male 30s)

Hence, it is apparent that customers want a firm's service delivery channels to be easy to use, self-sufficient in performing all the task and free of technical issues.

Interviewees also went into specific issues regarding system consistency. In terms of service recovery, respondents shared their frustration:

... The only thing is that when you call them, we have to wait, so that is the service I think they need to think about because in this busy world now you don't have much time. Even changing password, you need to go through so many processes, and they keep you waiting and then by the time you might give up, or you wait. If you give up then you can't do the transaction, so you have some kind of dissatisfaction. I think these are is still lacking in almost all cases. (Interviewee #16, Male 50s).

Another interviewee faced system issues of the online part of her banking channels:

... I think so. the only thing that concerns me is that their (bank's) website lags, that is why I don't prefer using the laptop for their web page because their mobile app never lags, or if in the web page it does, and I am midway through a transaction to pay someone, and it delays, I can't refresh, and if I do I don't know if the transaction happened. This happened to me, their web page froze, so I refreshed it, and the transaction went like two or three times, so that is why I am not quite comfortable using my bank's web page itself. (Interviewee # 11, Female 20s)

From the above interview excerpts, it is evident that customers want all the channels of the service provider free of system errors, easy to use and seamless. Having issues with even one channel may degrade the service quality perception of the whole firm.

3.5.3.2 Image Consistency

Image consistency refers to the consistent use of the firm's brand name, slogan, colour, and logo in all the channels (Oh & Teo 2010). The overall brand image of the firm should be reflected in all its channels for better integration quality. White et al. (2013) suggest ambient cues of a physical store such as temperature, music, and surrounding colours should be reflected in online channels through typesetting, graphics, and display colours.

Respondents indicated:

... All the images in all the channels are quite similar. And especially the colour and everything, like when you go and when you want to find an ATM. You can like see, since it has a distinct colour and helps to differentiate (Interviewee # 8, Female 30s).

... I think Commonwealth Bank branding is very consistent; it has only two colours; yellow and black. And their branch and every communication material, email, mail, physical campaigns reflect that colour properly. So, I have confidence with my bank wherever I use it. (Interviewee # 9, Male 30s).

Hence, it is evident that firms should focus on delivering a consistent image through all its service delivery channels.

3.5.4 Assurance Quality

Several studies of service quality have mentioned *assurance* as importance facet for service quality perception. Assurance of promised quality refers to the ability to convey trust and confidence within consumers by adding different channel attributes (Parasuraman et al. 1988; Piercy 2014). From the systematic literature review, it was found that assurance quality and its sub-dimensions have not been addressed in MCIQ literature. However, through qualitative data analysis, this research identifies assurance

quality and its sub-dimensions: *privacy, security, and service recovery accessibility* as essential factors influencing MCIQ. This research derives privacy and security from information systems and electronic service quality research (Parasuraman et al. 2005; Wolfinbarger & Gilly 2001; Yoo & Donthu 2001) and service recovery accessibility from service recovery literature (Hart et al. 1990; Smith et al. 2009; Zemke & Bell 1990).

3.5.4.1 Privacy and Security

Privacy and Security have been measured extensively for electronic service quality (Parasuraman et al. 2005; Wolfinbarger & Gilly 2001; Yoo & Donthu 2001). However, this construct is mostly neglected in multichannel service quality context. Privacy refers to the degree to which a customer's personal information is protected, while security refers to the safety of using service delivery channels (Parasuraman et al. 2005). Consumers provide personal information online via websites and mobile apps, as well as in-store via self-service technology such as kiosks, and touchless payment, making privacy an essential element of multichannel usage (Montoya-Weiss et al. 2003).

Interviewees shared the perceived importance of privacy protection:

... First thing is that it's the security and the other thing is privacy because I consider privacy very valuable thing to myself. Because using different channels, you send personal information. Anybody can misuse it and can access it without our knowledge and stuff. It is vital to me that my bank protects these important data. (Interviewee #6, Female 20s).

Interviewees were concerned about mobile channel security:

… Because in phone banking we have 4-digit or 6-digit passwords. So, with that you can actually change all your details that's including your home address, your mobile number,

your email address. So, if that four-digit or six-digit PIN gets hacked somehow then people can easily access your information which they should not get access to. So, you have to be careful about it. (Interviewee # 5, Male 20s).

While others were concerned about the website:

... Yeah, so I would probably be more concerned about the browser than the app because I know the results of dialers and viruses online and with some browsers I feel like, are more susceptible to hackers rather than the iPhone or the Apple IOS. I am really happy with IOS in terms of safety and security. But in websites, Software, malware that sort of plug itself into my computer. (Interviewee # 15, Female 30s).

Concerning the security of a physical facility, interviewees indicated:

... Depositing the money in ATM at night is of course risky. If you go to Ingleburn branch, for example, it is just by the roadside, and that's when it is late night, and you feel a bit insecure, and I felt as well because also people roaming around near the station. I think it is a bit risky to deposit and withdraw from there. (Interviewee # 16, Male 50s).

... My bank's ATMs have cameras, so something gets taken, you can ask for the video footage online. If you lose your card or anything like that you can lock or block your card. So, I am assured with the security of the physical aspect of it. (Interviewee # 4, Female 30s).

From the above transcripts, it is evident that security in terms of using multiple channels and privacy in terms of protection of information which are disclosed within these channels are of utmost importance for customers. It is not only one channel that these concerns are raised, but privacy and security issues are of concern within all the channels the customers use.

3.5.4.2 Service Recovery Accessibility

Service recovery accessibility refers to having different open channels available to customers through which they can voice their service-related issues conveniently (Smith et al. 2009). Service recovery research has always emphasised obtaining customer feedback (Hart et al. 1990; Zemke & Bell 1990). The multichannel facility will enable obtaining customer feedback from several sources through which recovery related issues can be integrated and analysed to perform services more seamlessly.

Interviewees went into specific issues regarding the importance of having different channels for service recovery process:

... I understood that I forgot my debit card inside the machine. Then I went inside the bank I asked the lady inside to check this ATM machine if my card is stuck there. We checked both machines, and my card wasn't inside. Then she told me to block my card using the app because it's lost or stolen. In the app, there is at the bottom that says if your card is stolen, can block it here. App helps really well, gets too many things very easy and also website is good, because when you don't have the application, but having more channels is always a good idea to resolve problems, I think. (Interviewee #20, Female 20s).

... I was a victim of identity theft. I lost my wallet in a bus stop, and I forgot my wallet there, and someone else got it. My driving license was there. My address was there, and they had my bank card. They did not steal anything. They returned the whole thing to the police station. But when I lost it, straight away when I came home, I rang the bank and said, "Okay I lost my wallet and I need a new ATM card". However, my ATM card was stolen from my letterbox before I collected it. Because whoever had my wallet had my address, had my date of birth from my license and expected where my ATM card would

be delivered. So, they were actually smart enough to steal my new ATM card instead of using the old one because they knew it would be deactivated anyways. So, they stole my new ATM card and started spending it. But they didn't know that a new feature with Commonwealth Bank's mobile app is they send notification whenever the card is used. So, I instantly got a notification and knew something was wrong. I blocked the new card through mobile app this time. If it wasn't for the mobile app, I would have lost money. (Interviewee #10, Male 30s).

Some respondents preferred alternatives compared to waiting on the phone:

... If I find some suspicious activities. If I see that my account is having a suspicious activity, somebody is taking money, or there is a discrepancy between the bank balance that I think I should access through the mobile banking. If I could've done it through the mobile banking, sending a message and come back to me, that would have been much better rather then I call their fraud line, wait there for fifteen minutes you know? (Interviewee #2, Male 50s).

While others wanted the call centre access to talk to a person directly:

... I was planning on buying a laptop, so I immediately took the credit card offered by my bank, which I was first, like going through what the rates and different things are, and I didn't understand some things, so I tried to knock them on their chat, and they were instantly responsive. So, I was actually chatting with them at 10 pm, so, I think they have facilities of 24/7 chat service. I still had confusion about some things and the person I was chatting with wasn't able to give me proper answers, I think, maybe he couldn't understand me, or I couldn't be clear about my needs. So then, I wanted to call and discuss with the bank, because I have been chatting for over half an hour and he wasn't still able to give me proper answers. So, I thought it would be better if I could get a hold of someone

to talk over phone. But the funny thing was, there was no number for a phone conversation on the credit card page, so I had to google the branch's number and call them. So, I think if they have a number, that supports 24/7 support as a phone service, like a person talking with me rather than just having a chat option, I think that will be better for them. (Interviewee #9, Male 30s).

These excerpts show how important having access to the service recovery team through multiple channels is essential as opposed to only being able to contact them through call centres or just through a chat system. Incorporating features within all the channels which enable customers to communicate with the firm and raise their service concerns quickly should be an integral part to ensure integration quality.

3.6 Conclusion

The principal objective of this chapter was to conduct an exploratory analysis to examine and confirm the existing dimensions of MCIQ. Besides, the exploratory analysis was also undertaken to explore new dimensions of MCIQ. To attain this, this chapter conducted a systematic literature review and thematic analysis to determine the dimensions and sub-dimensions of MCIQ. Furthermore, to confirm the identified dimensions and to explore new dimensions, this chapter conducted a qualitative study in the form of semi-structured interviews and focus group discussions. The results of the exploratory research have been reported in this chapter. Overall, the results of the exploratory research in this chapter solidify the basis for the research model proposed in chapter 4: Conceptual Model.

Chapter 4: Conceptual Framework and Hypotheses Development[4]

4.1 Introduction

The objective of this chapter is to build a multichannel integration quality (MCIQ) model based on the research findings and gaps found and synthesised in Chapter 2 (Literature Review) and Chapter 3 (Exploratory Research). This chapter aims to conceptualise the dimensions and subdimensions of MCIQ and to measure its overall impact on satisfaction and customer equity.

This chapter is set out as follows: In Section 4.2, the scope of the research model has been discussed, and the conceptual model of MCIQ has been illustrated. Furthermore, in this section, four hypotheses have been proposed to examine the relation between MCIQ and its dimensions. In Section 4.3, three more hypotheses have been proposed to examine the relationship between MCIQ and outcome constructs, and one hypothesis has been proposed to investigate the role of satisfaction as a mediator. Finally, in this section, a control hypothesis has been proposed to examine the role of contextual variables. In the last section, section 4.4, an overview of the model has been offered.

4.2 Conceptual Model

[4] An abridged version of this chapter was published in the following journal:

Hossain, TMT, Akter, S, Kattiyapornpong, U & Dwivedi, Y (2020), 'Reconceptualizing Integration Quality Dynamics for Omnichannel Marketing', *Industrial Marketing Management*, *87*, pp. 225-41.

Based on the thematic analysis and qualitative findings, this research has identified four dimension and ten subdimensions of MCIQ. The first dimension is *Channel-service configuration* which consists of three sub-dimensions, i.e., *breadth of channel choice, transparency of channels,* and *appropriateness of channels*. The second dimension is *content consistency* which includes two sub-dimensions, i.e., *information consistency* and *transaction data integration.* The third dimension is *process consistency* which consists of two sub-dimensions, i.e., *system consistency* and *image consistency.* Finally, the fourth dimension is *assurance quality* which consists of three subdimensions, i.e., *privacy, security* and s*ervice recovery accessibility* as factors influencing MCIQ.

Furthermore, through literature review, this research proposes customer equity as an outcome of MCIQ having satisfaction as a mediator between MCIQ and CUEQ. Based on these findings, this research proposes a conceptual model of MCIQ (Figure 4-1) and discusses it in detail in the next section.

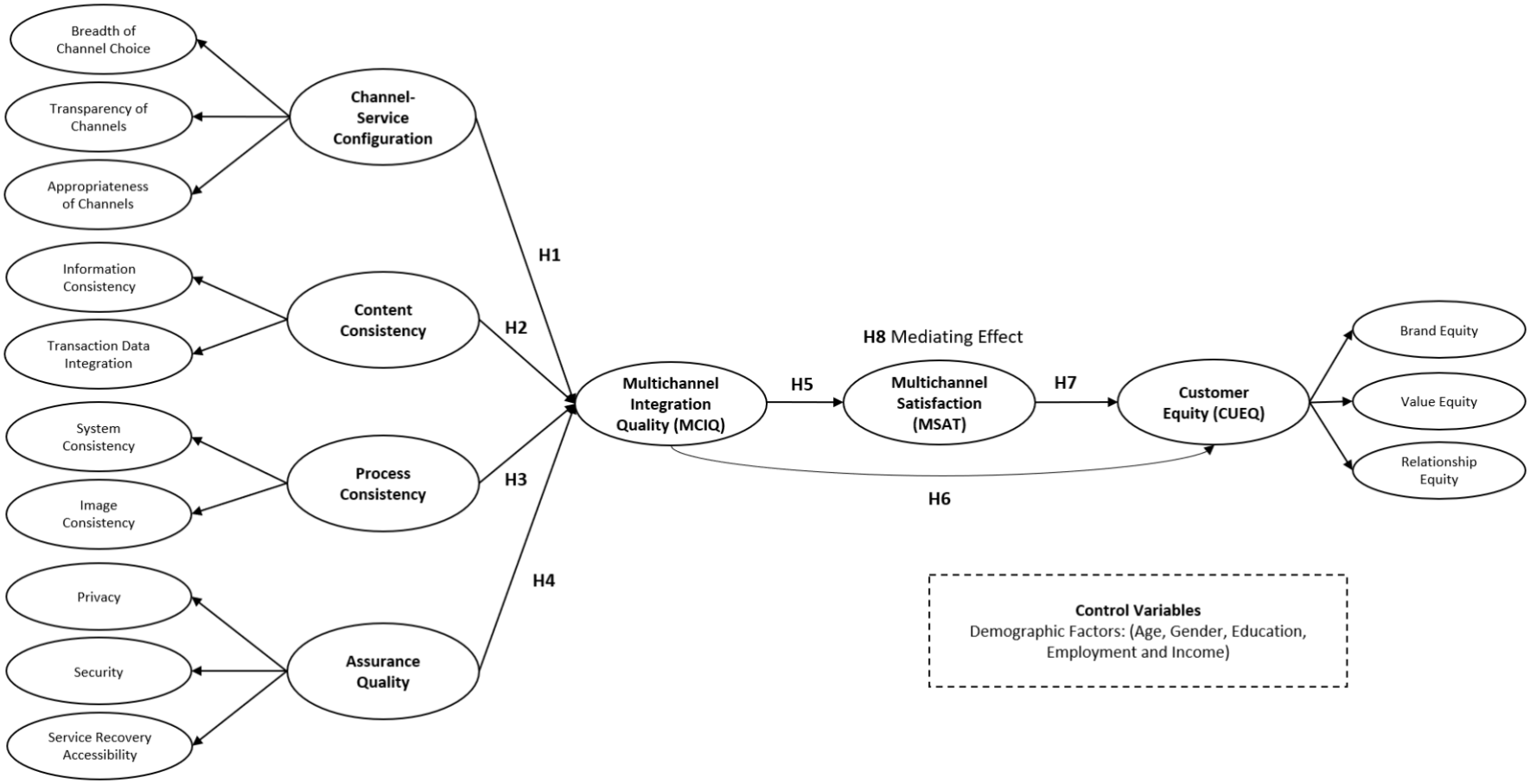

Figure 4-1 Conceptual Model of Integration Quality

4.2.1 Channel-Service Configuration and MCIQ

Channel-service configuration (CSCO) refers to channel performance in terms of providing services at the same level of quality and consistency (Banerjee 2014). It is mainly an association between services and channels within a firm (Sousa & Voss 2006). Hsieh et al. (2012) define CSCO as the availability and the complementarity of channels. CSCO consists of three sub-dimensions, i.e., *breadth of channel choice, transparency of channels, and appropriateness of channels*.

Breadth of channel refers to the availability of different channels through which a customer can avail various services (Lee et al. 2018; Sousa & Voss 2006). Organisations using a multichannel system, strive to offer different channels or channel breadth to customers for convenience in receiving services. Channel breadth allows customers to freely access information and service to fulfil their needs, which results in customer engagement and commitment (Shen et al. 2018). Customers purchase process includes search, purchase, delivery arrangement and in some instances, return. Breadth of channel ensures the availability of different channels through which customers can perform these tasks conveniently (Lee & Kim 2010). Breadth of channel can be achieved by ensuring different channels such as website, mobile app, physical stores, and so on are available for customers to avail service from. Breadth of channel is no longer a differentiator, rather a norm for multichannel organisations (Banerjee 2014). Thus, managing the complex array of channels without adversely affecting service quality and the relation between service quality and breadth of channels needs to be analysed (Banerjee 2014).

Transparency of channels refers to customer knowledge of existing channels. It is related to the awareness level of customers regarding the available channels and channel capabilities of the firm (Sousa & Voss 2006). It is the extent to which customers are

familiar with the attributes of all available channels (Shen et al. 2018). Organisations need to create an effort in terms of making customers aware of different channels and services offered through those channels. Transparency of channels can be achieved by informing customers about the firm's channels through advertisements, emails or face to face interactions. Website can be used to explain services provided through other channels, such as a mobile app, physical store and so on. Marketing materials such as posters, banners, and TV advertisement can also be used to make customers aware of the existing and new channels and service delivery processes.

Appropriateness of channels refers to the suitability of the channel in providing the service (Banerjee 2014). Banerjee (2014) argues that firms can easily introduce new channels, offer an array of features and services to ensure customer convenience, and inform customers about existing channels and service offers. However, if services are shifted and duplicated through channels without evaluating their appropriateness of those services according to the channel role, then the overall service quality may be affected, and the service cost may increase from duplicated services. Appropriateness of channels can be achieved by providing services through channels which are appropriate. Furthermore, not enforcing customers to use channels which they do not prefer for a service is also essential to ensure appropriateness. To gain competitive advantage, organisations race to add new channels and duplicate services to all the channels. However, there is increasing pressure of cutting costs while adding channels. These results in poor decisions of duplication, adding or migrating services across channels (Banerjee 2014). Therefore, to ensure service quality, organisations should be aware of the appropriateness of channels.

The above discussion illustrates the relation between CSCO and its sub-dimensions with MCIQ. To investigate this relationship with empirical evidence, the following hypothesis is postulated:

H1: Channel-service configuration (CSCO) positively influences multichannel integration quality (MCIQ).

4.2.2 Content Consistency and MCIQ

Content consistency refers to the consistency of outgoing and incoming information through different channels of the firm (Lee et al. 2018; Sousa & Voss 2006). It is the consistency of information traded between different channels or a cross-channel interaction (Shen et al. 2018). Content consistency of interactions across various channels produces an integrated, reliable and consistent service experience (Shen et al. 2018). Sub-dimensions of content consistency are *information consistency and transaction data integration*.

Information consistency refers to consistency and uniformity of information within all the channels the firm utilises (Banerjee 2014; Oh & Teo 2010). It is the outgoing information from an organisation. Organisations can provide information through various channels such as website, mobile app, call centres, in-store face to face interactions, and so on. Information consistency ensures outgoing information within these channels are identical, consistent and reliable. It ensures customer query posed through different channels results in similar answers. According to Cassab and MacLachlan (2009), customer's perception of integration is reflected through, *"in a consistent response to a query posed through different channels, or an interaction through one channel that takes into account past interactions through other channels"* (p. 5). Furthermore, information related to price, product assortment details, delivery details, and so on needs to be

consistent within all the channels. In multichannel setting inconsistent information about product or service features will confuse and frustrate consumers (Rangaswamy & Van Bruggen 2005). Prior literature shows the relation between trust and satisfaction with information consistently (Berman & Thelen 2004; Hsieh et al. 2012; Rangaswamy & Van Bruggen 2005).

Transaction data integration refers to collecting different types of customer data such as demographic data, purchase data, and so on and integrating it within all the channels to provide seamless service (Banerjee 2014). It is the incoming data that is received by the organisation from customers. Transaction data integration looks at customer data profiles and historic transaction with the organisation and integrates these data within all the channels. Transaction data such as search, purchase, order, delivery, complaints and special request in addition to demographic data, such as mailing and email addresses, telephone numbers, and purchase preferences can be captured in different channels and integrated into a central database to be accessed and used by all the channels of the organisation (Hsieh et al. 2012). Collecting customer data through different channels is the first step into predictive analytics and data analytics. After generating and storing data, predictive analytics and data analytics can provide deeper insights to sales, manufacturing, consumer behaviour, advertising, product development and so on (Waller & Fawcett 2013). Data are named the digital economy's "oil" (Wedel & Kannan 2016). Data from service delivery channels contributes to new strategic directions where better marketing-mix decisions can be made (Wedel & Kannan 2016). Customer data leads to better insights regarding pricing, customer relationship management, advertising, and new product development (Sathi 2014). Transaction data thus can be used by firms to provide personalised services to customers at an individual level (Godfrey et al. 2011). Personalisation takes marketing mix strategies to a new level where product, price,

promotion and distribution caters for the individual customer needs (Khan et al. 2009). Transaction data integration develops a single view of a customer by utilising past transactions of the customers from all the channels they have interacted (Hsieh et al. 2012). Prior studies have focused on data integration within multichannel services as an antecedent of customer satisfaction (Berman & Thelen 2004; Godfrey et al. 2011; Rangaswamy & Van Bruggen 2005) and firm performance (Wamba et al. 2017).

The above discussion illustrates the relation between CONC and its sub-dimensions with MCIQ. To investigate this relationship with empirical evidence, the following hypothesis is postulated:

H2: Content consistency (CONC) positively influences multichannel integration quality (MCIQ).

4.2.3 Process Consistency and MCIQ

Process consistency is related to service design which refers to the consistency of various customer-facing elements that are relevant and comparable within different channels. Indicators of process consistency include the service's feel, image, waiting times and employee discretion level (Banerjee 2014; Shen et al. 2018; Sousa & Voss 2006). This research identifies two sub-dimensions of process consistency; namely, *system consistency and image consistency.*

System consistency which is derived from information systems and electronic service quality research refers to ensuring all the channels of the firm perform at a consistent level considering the technical issues of service delivery processes (Akter et al. 2016; Delone & McLean 2003). System consistency can be achieved by ensuring ease of use and convenience of navigation, search, order, payment, delivery, and return using all the

channels of the firm. Efficient shopping experience which ensures convenience and positive time perception is influential in multichannel usage behaviour (Kwon & Jain 2009). Store layout and design, convenience of finding products, ease of payment and other tangibles are related to ease of use within an offline context (Kim et al. 2005; Parasuraman et al. 1985), while website or mobile app functionality, layout, flow, and ease of payment facilities are related to ease of use in an online context (White et al. 2013).

Image consistency refers to the consistent use of the firm's brand name, logo, slogan and colour within all the channels (Oh & Teo 2010). To ensure image consistency, ambient cues of a physical store such as logo, surrounding colours, music and overall feel should be reflected through typesetting, graphics, and display colours in websites and mobile apps (White et al. 2013). Channel integration leads to the synergy between an organisation's offline and online operations, which in turn enriches customer experience and strengthen the brand image from both offline and online channels. On another word, offline brand image affects the perception of online image while online brand image affects the image of offline brand image. Thus, the interplay between offline and online brand image plays a vital role in customers' perception of the firm's overall service performance (Kwon & Lennon 2009).

The above discussion illustrates the relation between process consistency (PROC) and its sub-dimensions with MCIQ. To investigate this relationship with empirical evidence, the following hypothesis is postulated:

H3: Process consistency (PROC) positively influences multichannel integration quality (MCIQ).

4.2.4 Assurance Quality and MCIQ

Assurance quality refers to different channel attributes which convey trust and confidence within consumers. Through qualitative data analysis, this research conceptualises consumers' perception of assurance quality in a multichannel environment which is confirmed through ensuring *privacy, security, and service recovery accessibility* within all the channels.

Privacy and Security have been measured expansively within electronic service quality research (Parasuraman et al. 2005; Wolfinbarger & Gilly 2001; Yoo & Donthu 2001). However, these constructs are mostly neglected in MCIQ context. *Privacy* refers to the protection of personal information that is left on different channels while availing services. *Security* refers to the extent to which all channels are safe to use (Parasuraman et al. 2005). Privacy and security issues have become an essential consideration for customers as more customer data is available in multiple sources and strategies involving personalisation are widely enacted (Wedel & Kannan 2016). Consumers provide personal information online via websites and mobile apps, as well as in-store via self-service technology such as kiosks, and touchless payment.

On the other hand, the security of using both online and offline channels are essential to customers. Online security can be ensured by making the website and mobile app free of malware and bugs, while physical security can be guaranteed by installing security cameras and taking other security measures (Swaid & Wigand 2012). Privacy and security thus are not confined to online channels only but also are essential components of multichannel usage (Montoya-Weiss et al. 2003). Privacy and security create a 'privacy paradox' (Norberg et al. 2007) as customers will want to utilise the benefit of multichannel services and at the same time they want to protect their personal data.

Service recovery accessibility refers to offering customers with open lines of communications through which they can voice their service-related issues conveniently. Service recovery has been viewed as a broad multi-dimensional construct with accessibility as one of its dimensions along with formality, decentralisation, comprehensiveness, human intensity, system intensity, and influence (Smith et al. 2009). Accessibility of service recovery provides the provision for capturing the complaints of customers through different channels when service-related issues occur. Service recovery information can be accessed through various channels. Prior literature emphasised on toll-free numbers (Tax & Brown 1998) whereas current studies focus on multichannel such as website (DeWitt & Brady 2003), digital support sites, frequently asked questions or FAQs, online chat experiences, emails (Singh & Crisafulli 2016) and so on as service recovery sources. Service recovery research has always emphasised obtaining customer feedback (Hart et al. 1990; Zemke & Bell 1990). Collecting customer feedback is vital for organisations as without that service recovery cannot be even attempted. Justice through service recovery has been associated with various positive behavioural intentions including word of mouth and repurchase intentions and satisfaction (Ha & Jang 2009; Kim et al. 2009; Nikbin et al. 2012; Ok et al. 2005). Companies should utilise different channels to enable customers to inform service issues easily.

The above discussion illustrates the relation between assurance quality (ASNQ) and its sub-dimensions with MCIQ. To investigate this relationship with empirical evidence, the following hypothesis is postulated:

H4: Assurance quality (ASNQ) positively influences multichannel integration quality (MCIQ).

4.2.5 Multichannel Integration Quality: A Hierarchical Model

Based on the extant literature review and qualitative data analysis, this study proposes a conceptual model of MCIQ in Figure 4-1. This study defines MCIQ model as a hierarchical and multidimensional construct.

Hierarchical constructs or multidimensional constructs are constructs with more than one dimension where each dimension reflects some fraction of the overall latent variable (Edwards 2001; Jarvis et al. 2003; Law et al. 1998; MacKenzie et al. 2005; Wetzels et al. 2009). Hierarchical modelling is also known as a measurement modelling that makes it possible to fit different independent and dependent variables (Fisher 1980). Because of the multidimensional aspect of higher orders constructs, they vary entirely from uni-dimensional constructions which comprises of a single fundamental dimension (Netemeyer et al. 2003). In theory, hierarchical modelling illustrates how individuals integrate their estimation of subdimensions to shape primary dimensions, contributing in addition to a general perception of a given construct. Because theoretical models include the capturing of a construct's general dimensions, hierarchical modelling can be used to capture specific aspects of a construct. Overall, the conceptual justification of the proposed hierarchical model of MCIQ will be offered with empirical findings in terms of construct reliability and validity in Chapter 5.

A hierarchical structure is better in capturing the intricacies of human perception (Dabholkar et al. 1996). Thus most research on service quality has relied on hierarchical constructs, i.e., Rust and Oliver (1994) conceptualised service quality as a multilevel-multidimensional model; Dabholkar et al. (1996) proposed service quality at three levels: overall perception, primary dimensions and subdimensions; Brady and Cronin (2001) argued service quality as a third-order construct which consists of three first-order

dimensions and nine subdimensions across four service industries; Fassnacht and Koese (2006) proposed service quality having three primary dimensions and nine subdimensions. The findings of Dagger et al. (2007) were also compatible with a previous study suggesting that the quality of service is a hierarchical construct consisting of four main dimensions and nine general subdimensions within general medical services. Furthermore, although there are not many service quality models proposed within multichannel services, few studies indicated multichannel service quality as a hierarchical model (Oh & Teo 2010; Wang, T et al. 2016; Wu & Chang 2016).

Aligned with these explorations, this study specifies the MCIQ model as a third-order, hierarchical construct model which is composed of four dimensions (i.e., channel-service configuration, content consistency, process consistency, and assurance quality) and ten sub-dimensions (i.e., breadth of channel choice, transparency of channels, appropriateness of channels, information consistency, transaction data integration, system consistency, image consistency, privacy, security, service recovery accessibility). Based on the types of hierarchical models (Becker et al. 2012) this study proposes MCIQ as a reflective-formative model in which first-order constructs are reflective, and the second-order and third-order constructs are formative (see Figure 4-1). (Becker et al. 2012; Petter et al. 2007; Polites et al. 2012). According to Finn and Wang (2014), if items "reflect", i.e. depict a construct, it is a reflective measurement and if items "form", i.e. build a construct, it is a formative measurement. In this research MCIQ and the second-order constructs, i.e., is a reflective construct, i.e., channel-service configuration, content consistency, process consistency, and assurance quality are formative constructs, while all the first-order dimensions, i.e., breadth of channel choice, transparency of channels, appropriateness of channels, information consistency, transaction data integration, system

consistency, image consistency, privacy, security, service recovery accessibility are reflective (see Figure 4-1).

4.3 Effects of MCIQ on Service Outcomes

In addition to conceptualising antecedents of MCIQ, this research encapsulates the outcomes of MCIQ. Figure 4-2 provides a snapshot of multichannel integration quality – multichannel satisfaction – customer equity relationship framework.

4.3.1 MCIQ and Satisfaction

Regarding the impact of MCIQ on service quality perceptions, the extant literature indicates the effect of multichannel service quality on satisfaction. Satisfaction is defined as a customer's overall judgment regarding a product or service that fulfilled a customer's consumption-related objective (Oliver 2014). Scholars have identified satisfaction from several viewpoints, such as a psychological state (Howard & Sheth 1969), a fulfilment response (Oliver 1997), an overall evaluation (Fornell 1992), a global evaluative judgement (Westbrook 1981), and a summary attribute phenomenon (Oliver 1993). From the transactional side, satisfaction is "*an immediate post-purchase evaluative judgment or an effective reaction to the most recent transactional experience with the firm"* (Garbarino & Johnson 1999, p. 71). The quality of the transaction determines the perception held by a customer regarding goods or services (Ngobo 1997). On the other hand, the global evaluation of satisfaction is "*an overall evaluation based on the total purchase and consumption experience with a good or service over time"* (Anderson et al. 1994, p. 54) or the overall sum of the experience (Garbarino & Johnson 1999). This study focuses on the overall satisfaction with multichannel attributes of a firm based on the customer experience of using all the channels of the firm to avail a service.

In numerous studies, the connexion between service quality and satisfaction was highlighted, where service quality was found to influence customer satisfaction (Ennew & Binks 1999; Pedraja Iglesias & Jesus Yagüe Guillén 2004; Zeithaml et al. 2002). Service quality is the customers' global impression of whether a product or service is superior or inferior (Ngobo 1997). Satisfaction is an attitudinal construct or an affective response (Haistead et al. 1994), while service quality is reflected as a cognitive construct (Brady & Cronin 2001; Cronin & Taylor 1992). Service quality literature has indicated satisfaction as an affective response to a cognitive behavioural approach towards service quality (Oliver 1997; Taylor & Baker 1994). Therefore, it can be argued that the service quality within any causal framework should be a criterion for satisfaction (Choi et al. 2004; Cronin & Taylor 1992).

Satisfaction has been studied from a single channel perspective (Wallace et al. 2004), where channel satisfaction has been modelled and validated against different channel attributes (Hammerschmidt et al. 2015). Past research has shown that service quality provided in both offline and online channels determines satisfaction (Montoya-Weiss et al. 2003). It is an essential construct in exploring channel relationship and is the motivation for participants to stay with the channel (Geyskens et al. 1999). Within the online channel context, Zeithaml et al. (2002) have shown that the quality of delivered service impacts satisfaction, retention and profitability. Furthermore, Devaraj et al. (2002) argue that e-commerce service quality affects customers channel satisfaction.

Looking forward towards multichannel context, studies have shown a firm's contact points have influenced customer satisfaction (Sousa & Voss 2006). Customers' perception of service quality and their satisfaction do not depend on a single channel perspective. Instead, customers attitude towards the firm develop by using all the channels of the firm (Montoya-Weiss et al. 2003; Sousa & Voss 2006; Van Birgelen et al. 2006).

Customers compare different features when making satisfaction judgement of multichannel services (Heitz-Spahn 2013; Noble et al. 2005). Customers tend to focus mainly on general service features such as cost, product selection, and availability when determining the service quality of multichannel systems. Consequently, customers focus on the channel-specific features such as waiting time, store design and layout for offline channels, and system stability and format for online channels to judge the overall quality of multichannel services. This assessment makes customer evaluation of satisfaction through service quality important from both online and offline channels simultaneously. Based on this evaluation, Hammerschmidt et al. (2015) propose a model to capture offline and online channel satisfaction simultaneously where customers perception of satisfaction is measured from multichannel usage.

Investigation of multichannel service quality perception leads to determine satisfaction as a critical MCIQ outcome (Blázquez 2014; Dholakia et al. 2010; Neslin & Shankar 2009; Verhoef et al. 2007). Multichannel service delivery is used in a complementary fashion by customers, and each channel contributes to the overall comparison of service of the firm (Patrício et al. 2003). Due to this phenomenon and also the suggestion of the relationship between satisfaction and customer equity (Wang, H et al. 2016), this research addresses satisfaction from a multichannel perspective.

H5: Multichannel integration quality (MCIQ) positively influences multichannel satisfaction (MSAT).

4.3.2 MCIQ and Customer Equity

Customer equity results by maintaining a long-term relationship with customers using different marketing techniques (Blattberg et al. 2009; Wang, H et al. 2016). Lemon et al. (2001) define customer equity as customer's discounted lifetime value. Existing research

proposes three drivers of customer equity; namely, brand equity, value equity, and relationship equity (Lemon et al. 2001; Leone et al. 2006; Rust et al. 2001; Rust et al. 2004). *Brand equity* refers to the direct and intangible evaluation of the brand by customers and has been discussed in numerous service quality literature (Ailawadi & Farris 2017; Neslin et al. 2006; Picot-Coupey et al. 2016; Verhoef et al. 2015). Research on multichannel integration covers the area of brand consideration and brand experience (Picot-Coupey et al. 2016; Verhoef et al. 2015). Neslin et al. (2006) argue that channel integration strengthens customer relationships with the brand as it helps the company to offer value-added services and customisation. Swoboda et al. (2007) state that service quality tends to be the most crucial feature of retailers to build a strong retail brand. Likewise, *value equity* is a customer's perception of the overall service based on the evaluation of what is received, compared to what is given (Zeithaml 1988). It has been indicated as an outcome of integration in various studies (Herhausen et al. 2015; Hsieh et al. 2012; Wu & Chang 2016). Finally, *relationship equity* refers to customer evaluation of their affiliation with the company (Hennig‐Thurau & Klee 1997). Few studies have confirmed integration as one of the critical marketing tactics to retain customers for a more extended period (Hsieh et al. 2012; Payne & Frow 2004; Van Baal 2014).

Concerning service quality outcomes on consumer perception, Wang, H et al. (2016) propose service quality has a significant impact on consumer equity. Several other studies also indicate the relation between customer equity and quality (Kim 2015; Rust et al. 2004). Drivers of customer equity were found as critical behavioural outcomes for companies ensuring service quality in a multichannel setting (Hsieh et al. 2012; Lee et al. 2018; Oh & Teo 2010; Van Baal 2014; White et al. 2013). Further research on customer equity drivers is required according to these studies. Moreover, the unified effect of equity drivers on customer equity is still untested not only within multichannel service quality

but service quality itself. Therefore, it is imperative to test the effect of multichannel service quality or integration quality on customer equity. Hence, this research examines the impact of MCIQ and satisfaction on customer equity by postulating the following hypotheses:

H6: Multichannel integration quality (MCIQ) positively influences customer equity (CUEQ).

H7: Multichannel satisfaction (MSAT) positively influences customer equity (CUEQ).

4.3.3 The Mediating Role of Satisfaction

Mediation takes place when the direct relationship between two variables is also affected indirectly through a third (mediating) variable. The third variable is called a mediator variable. More specifically, a modification in the exogenous construct leads in a change in the mediator variable, which affects the endogenous construct in response. Analysing the complexity of the interactions of the mediator variable with the other constructs enables understanding the cause and effect interaction between an exogenous construct and an endogenous construct (Hair et al. 2017).

This research tests satisfaction as the mediator between MCIQ and customer equity. Compared to a single-channel customer, customers using multiple channels of a firm have higher expectations from every channel (Shankar & Winer 2005), resulting in higher pressure on the multichannel firm to perform better through the development of better multichannel strategies (Hsieh et al. 2012). However, the positive side is, if multichannel firms can fulfil multichannel shoppers' needs, it results in a better overall outcome for the firm. Hence, satisfaction acts as a mediator for other behavioural outcomes. For example,

Wallace et al. (2004) indicate that satisfaction is a better predictor of loyalty for multichannel customers when compared to single-channel customers. Customers are more likely to be satisfied with various services due to being exposed to an enhanced portfolio of services delivered through a multichannel firm.

An empirical study by Wang, H et al. (2016) proposes to test the relationship between service quality, satisfaction, and customer equity and suggests that companies should emphasise and improve service quality to maintain customer satisfaction and consequently gain customer equity. Additionally, equity theory supports the relation between perceived equity with satisfaction (Vogel et al. 2008). This research investigates the influence of satisfaction as a mediator of integration quality and customer equity because, first, MCIQ (predictor) influences MSAT (mediator), second, MSAT influences CUEQ (criterion variable), and finally, MCIQ affects the criterion variable even if the mediator's influence is not presented (Akter, D'Ambra, et al. 2013; Baron & Kenny 1986). The following hypothesis has been postulated in this regard:

H8: Multichannel satisfaction (MSAT) mediates the relationship between multichannel integration quality (MCIQ) and customer equity (CUEQ).

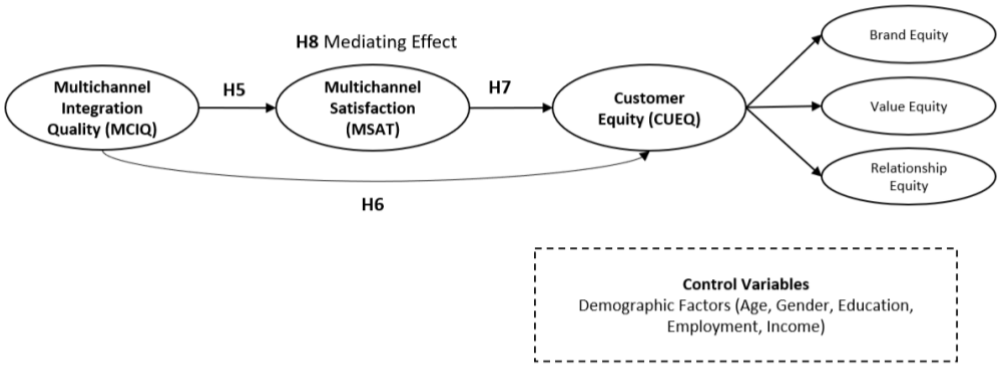

Figure 4-2 Effects of MCIQ on Service Outcomes.

4.3.4 Effects of Control Variables on Service Outcomes

This study uses demographic factors as control variables impacting on the proposed model of MCIQ (see Figure 4-2). It further demonstrates the control variables' direct impact on the ultimate outcome construct (i.e., CUEQ). This study characterises demographic factors as the individual customer features, such as age, gender, education, employment and income. Research has shown that demographic factors lead to individual customer behavioural differences (Venkatesh et al. 2003). Studies propose to evaluate the impact of contextual variables on the model of the final outcome, (Cooil et al. 2007; Venkatesh & Davis 2000) which is customer equity (CUEQ) in this study.

In addition, the study specifies these control variables as formative measures as changes in these variables will cause changes in the corresponding constructs (Jarvis et al. 2003). As a result, the theoretical direction of causality for this research is from measures to constructs which indicates that measures are the defining characteristics of the constructs (Jarvis et al. 2003; Petter et al. 2007). Furthermore, this definition suggests that measures do not co-vary with each other, and they are not interchangeable (Jarvis et al. 2003).

Thus, this study posits the following hypotheses regarding control variables:

H9 (control hypothesis): Customer Equity (CUEQ) varies as per the demographic characteristics (i.e., age, gender, education, employment and income).

4.4 Overview of the Model

Table 4-1 illustrates an overview of the proposed research model of MCIQ:

Table 4-1 An overview of the MCIQ model

Theory Overview	The proposed theory on multichannel integration quality (MCIQ) explains the dimensions and subdimensions of multichannel service quality and its overall impact on satisfaction and customer equity. This theory is formulated on multichannel service quality theory within IS and Marketing literature.
Means of representation	Diagram and explanation
Primary constructs	**Third-order construct:** Multichannel integration quality (MCIQ) **Second-order constructs**: Channel-service configuration, content consistency, process consistency, assurance quality. **First-order constructs:** Breadth of channel choice, transparency of channels, appropriateness of channels, information consistency, transaction data integration, system consistency, image consistency, privacy, security and service recovery accessibility **Outcome constructs:** Multichannel satisfaction, customer equity (second-order construct) consisting of three first-order constructs, i.e., brand equity, value equity and relationship equity. **Control variables:** Demographic factors (i.e., age, gender, education, employment and income) **Mediator:** Multichannel satisfaction as a mediator between MCIQ and customer equity
Statements of relationship	Overall, MCIQ is a third-order construct, which consists of channel-service configuration, content consistency, process consistency and assurance quality as its dimensions. Channel-service configuration is reflected by breadth of channel choice, transparency of channels, and appropriateness of channels; content consistency is reflected by information consistency and transaction data integration; process consistency is reflected by system consistency and image consistency; and assurance quality is reflected by privacy, security and service recovery accessibility. Furthermore, MCIQ determines multichannel satisfaction (MSAT) and customer equity (CUEQ). CUEQ is reflected by brand equity, value equity and relationship equity.
Hypotheses	H1: Channel-service configuration (CSCO) positively influences multichannel integration quality (MCIQ). H2: Content consistency (CONC) positively influences multichannel integration quality (MCIQ). H3: Process consistency (PROC) positively influences multichannel integration quality (MCIQ). H4: Assurance quality (ASNQ) positively influences multichannel integration quality (MCIQ). H5: Multichannel integration quality (MCIQ) positively influences multichannel satisfaction (MSAT). H6: Multichannel integration quality (MCIQ) positively influences customer equity (CUEQ). H7: Multichannel satisfaction (MSAT) positively influences customer equity (CUEQ). H8: Multichannel satisfaction (MSAT) mediates the relationship between multichannel integration quality (MCIQ) and customer equity (CUEQ). H9 (Control hypothesis): Customer Equity (CUEQ) varies as per the demographic characteristics (i.e., age, gender, education, employment and income).

4.5 Conclusion

The aim of this chapter was to establish a model of multichannel integration quality and showcase its association with customer satisfaction and customer equity. Based on extant literature, the proposed research model specifies that MCIQ is a third-order, hierarchical model comprising of four second-order dimensions and ten first-order sub-dimensions. This research proposes four hypotheses to show the association between MCIQ and its dimensions. Furthermore, this chapter offers three hypotheses to show the relation between MCIQ, multichannel satisfaction and customer equity. One hypothesis has been proposed to explain satisfaction as the mediator between MCIQ and customer equity. Finally, a hypothesis was proposed for contextual factors as control variables on the extended model.

Overall, the proposed research model addressed the gaps described in Chapter 2 (Literature Review). The thesis addresses research methodology with its hypothetical relationships in the next part, to validate the proposed conceptual model.

Chapter 5: Research Design and Methodology

5.1 Overview

This chapter aims to describe the methodological considerations used to conduct the study. The chapter begins by introducing the positivist research paradigm, the use of the quantitative method and web survey, followed by explaining the procedure for sampling and collating the research data. Then, the chapter discusses the statistical methods used to validate and analyse the data as well as to calculate the parameters of the research model.

This chapter is a prerequisite for Chapters 6, 7 and 8. Chapter 6 outlines the pilot study for instrumentation, Chapter 7 describes the data analysis technique for hierarchical modelling, and finally, Chapter 8 outlines the analysis and results of the main study. This chapter is designed as follows: research paradigm is discussed in section 5.2; research philosophy is discussed in section 5.3; research method is discussed in section 5.4, data collection, and sampling process is discussed in section 5.5. In section 5.6, the measurement development techniques have been discussed. In section 5.7, reliability and validity and in section 5.8, data analysis technique have been discussed. Finally, statistical considerations are discussed in section 5.9 with the higher-order construct estimation in section 5.10. Control variables consideration is included in section 5.11. In general, this chapter defines strict research design by supporting literature guidance and the use of the appropriate research techniques in each step.

5.2 Research Paradigm

Research paradigm is defined as *"the basic belief system or world view that guides the investigation"* (Guba & Lincoln 1994, p. 105). Research paradigm varies according to

the assumption of each investigation that an organization makes. Thus, there should be a single paradigm that researchers should stick to (Mingers 2001). Research paradigm can be divided into four categories: radical humanism, radical structuralism, interpretivism, and functionalism (Ardalan 2010; Burell & Morgan 1979; Taylor & Callahan 2005). Radical humanism refers to the concern of releasing social constraints that bound human capacity. It is mostly a paradigm to bring revolutionary change and mainly anti-organization in scope (Ardalan 2010; Burell & Morgan 1979; Taylor & Callahan 2005). Radical structuralism refers to the constant change within society due to political and economic conflicts. This paradigm is based on theories of Marx, Engles and Lenin (Ardalan 2010; Burell & Morgan 1979; Taylor & Callahan 2005). Interpretivism refers to the observation of stable individual behaviour or the "on-going process" (Ardalan 2010; Burell & Morgan 1979; Taylor & Callahan 2005). Finally, functionalism refers to rational human action and suggests behaviour can be comprehended through testing of hypotheses. This is the key paradigm for organizational study (Ardalan 2010; Burell & Morgan 1979; Taylor & Callahan 2005).

This research follows the functionalist paradigm to conceptualise and test dimensions and outcomes of MCIQ. As this research is using hypothesis testing and suggests that logical human action can determine organizational outcomes, the selected paradigm fits the research objective. While the other paradigms are anti-organizational, this functionalist paradigm looks at logical relationships and can be quantified scientifically. Furthermore, this functionalist paradigm has been validated academically as suitable for consumer and organizational studies (Burell & Morgan 1979). Hence, the choice of utilising functionalist paradigm is justified.

5.3 Research Philosophy

Research philosophy relates to the set of ideologies in understanding lives. It is related to knowledge creation and the essence of that knowledge (Saunders et al. 2019). Saunders et al. (2019) describe four types of research philosophy, i.e., positivism, realism, interpretivism, pragmatism. This research undertakes a positivist research philosophy. Positivist research philosophy assumes that through causal relationships which are representative and measured correctly, the world of phenomenon can be explained (Sarantakos 2012). It involves *"precise empirical observations of individual behaviour in order to discover ... probabilistic causal laws that can be used to predict general patterns of human activity"* (Neuman 2013, p. 71). The aim of positivist research is to comprehend the objective and social reality. Its purpose is to comprehend the phenomenon by variable measuring, theory testing, hypothesis testing, and utilising sample in fixed population to analyse the phenomenon (Saunders et al. 2019). In accordance with the goal of positivist research, this study aims to determine factors influencing MCIQ and their effects on behavioural intentions within multichannel services.

Furthermore, this research has implemented an explanatory research design. Explanatory research aims to explain the cause-and-effect relationship and explains what causes what effects (Hair et al. 2007). This research has already proposed a research model relying on concepts, constructs, theories and relationship sketched on prior literature on MCIQ. Next, this research aims to measure these variables and test the causal relationship within the proposed constructs. Thus, this research appropriately utilises an explanatory research approach.

This research uses a deductive approach of writing. A deductive approach is concerned with “developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis” (Wilson 2014). A deductive approach generates findings or conclusions from premises or propositions. This research undertakes a deductive approach as it helps to explain the causal relationship between concepts and variables. Furthermore, deductive approach is used to measure concepts quantitively, which is the case of this research. Finally, deductive approach generalizes findings to a certain extent which is required for this research (Wilson 2014).

5.4 Research Method- Survey

To establish a comprehensive understanding of the dimensions of MCIQ and its impact on perceived service outcomes, this research has applied the survey method. Survey refers to a standardised questionnaire distributed to a sample population to provide the participants with specific information (Malhotra 2019). This research utilises survey method due to several reasons. First, survey methods are useful to describe the causal relationship between different constructs and provide findings which can be generalised in a research context (Gable 1994; Pinsonneault & Kraemer 1993). Second, survey method can archive the norm, distinguish extreme data and outline the relationship between factors in a sample (Gable 1994). Finally, survey methods have moderately prevalent 'deductibility' power which is essential for causal relationships (Vidich & Shapiro 1955). Likewise, Saunders et al. (2019) suggest using survey methods due to its explanatory and predictive power which can be generalised with noteworthy trust. From the literature review, it is evident that dimensions of integration quality have not yet been generalised (Banerjee 2014; Sousa & Voss 2006). Hence, to explain the causal relationship of MCIQ dimensions and outcomes and to generalise the conceptual model to a population, survey method has been deemed fruitful for this research.

5.4.1 Cross-sectional Survey Design

This study utilises a cross-sectional survey design. Survey designs can be divided into cross-sectional or longitudinal (Saunders et al. 2019). Cross-sectional surveys are studies that collect data from a population sample only once, maybe over a week or month period, while longitudinal studies are done where data are collected from a population sample at more than one point of time (Sekaran & Bougie 2016). Cross-sectional surveys provide for representative sampling and minimum bias in response (Dabholkar et al. 2000). Furthermore, most studies in service quality research have used the cross-sectional design (Brady & Cronin 2001; Dabholkar et al. 2000; Parasuraman et al. 1988; Parasuraman et al. 2005).

5.5 Data Collection Procedure

The preference of method for data collection is an integral part of the research phase (Cooper & Schindler 2008). Justifying the choice of the target population, sampling technique, sampling frame, and sampling plan are crucial aspects for any research involving data collection (Saunders et al. 2019).

The aim of this paragraph is to explain the process of data collection used in this research. The method of data collection includes sampling technique, sample frame, unit and element, target setting, sample profile and recruitment technique. Table 5-2 presents an overview of the data collection process, which is discussed in greater detail below:

Table 5-1 Overview of Data Collection Strategy

Target Population	Customers using multichannel services
Sampling Frame	Multichannel banking customers of Commonwealth Bank of Australia
Sampling Element	Customers of who are 18+ years old and have experience of using the bank's mobile app, website and physical branch in the last three months
Target Setting	Australia

Method of Sampling	Nonprobability sampling for interviews and probability sampling for survey
Sample Size	301 completed surveys (52 pilot test and 249 main study)
Method of Data Collection	Online questionnaire through a research panel

5.5.1 Sampling Technique

Researchers should decide which sampling technique to use. It should be derived from the subject population, the 'fit' with their research considerations (time, cost, etc.) and the stage in which their research is conducted (confirmatory or exploratory) (Cooper & Schindler 2008). Sample elements can be selected using probability or non-probability techniques (Cooper & Schindler 2008; Schreuder et al. 2001). A probability sampling strategy is based on random choice, with a high likelihood of selection in each population group (Malhotra 2019). Random selection minimises the specific choice factor in the survey and removes subjective selection biases (Sibona & Walczak 2012). Non-probability sampling is a sequence of techniques in which the researcher renders an element of choice (Malhotra 2019).

This study adopted the probability sampling technique that is purposive sampling using simple random sampling (SRS) procedure. Purposive sampling is a strategy in which target elements conform to specific criteria (Cooper & Schindler 2008). In this technique, the researcher investigates those who meet a particular criterion and are suitable for their study purpose (Cooper & Schindler 2008; Schreuder et al. 2001; Sibona & Walczak 2012). A simple random sampling enables selection of respondents in a subset of a population where every member of that subset has (Malhotra 2019) an equal probability for selection. A simple random sample is meant to represent a population on an impartial basis. The reason for choosing purposive sampling is that the process of sampling was intended to identify people who had specific criteria that were under investigation, as

discussed in the following sub-sections (target population, sampling frame and sampling setting).

5.5.2 Target Population with Sampling frame, Unit and Element

One of the essential components of the sampling design process is the definition of the target population (Cooper & Schindler 2008). The target population refers to the sample elements and the groups from which the researcher gathers information and draws research conclusions (Malhotra 2019). It separates the respondents and non-respondents, and therefore it is important to accurately determine who should be in the survey and who should not. For this research, the target population was selected as customers who use multiple channels to avail services. To determine multichannel integration quality, the behaviour of multichannel customers is essential to analyse. Having experience of using multiple channels of a company would help customers to gauge the service quality level of a multichannel company.

The sampling frame refers to the actual set of elements from the population of interest from which a sample has been drawn (Cooper & Schindler 2008). For this research, customers of a high ranked bank (Commonwealth Bank of Australia) using multiple channels to serve its customers in Australia has been chosen as the sampling frame. Commonwealth Bank of Australia (CBA) has been selected based on its multichannel service delivery options. With a customer base of 16.6 million, out of which 6.2 million customers use digital channels, CBA is Australia's one of the largest banks (Commonwealth Bank of Australia Annual Report 2017). CBA provides banking services to its customers through various channels such as banking branch, cash machine or ATM, web or internet banking and mobile banking (apps/tablet), customer call centre and so on.

A sampling element is referred to as a single unit that is selected from a sample (Cooper & Schindler 2008). The sample of the research participants has been chosen purposefully so that they are the best representative of the population (Creswell 2013; Glesne 2006). For this research, banking customers who are 18+ years old and have experience of using banking branch, website and mobile app in the last three months was chosen as the sampling element. Most banking customers have experience in using the three selected channel, i.e., physical branch, mobile app and website of a bank (Retail Banking Insights 2014). A report by Accenture (2015) illustrates that the channels mentioned above are playing a significant role to create customers' multichannel experience in the banking industry. The report indicates, 64% customers have used internet banking for accessing banking services such as making payments or money transfer, 42% have visited the physical branch, and 30% have used mobile banking service in a month. In contrast, for fixing issues such as managing a complaint, 21% of customers have used internet banking, 15% have visited the physical branch, and 15% have used mobile banking service in a month. Hence, selecting these three channels provides better opportunity to gather data regarding multichannel usage and will be valuable to understand the dimensions and outcomes of integration quality.

5.5.3 Recruiting technique

In behavioural surveys, recruitment methods appear similar because little evidence exists about which method produces subjects with more reliable survey responses (Alvarez et al. 2003; Sibona & Walczak 2012). Therefore, researchers should choose a recruitment method that is available and which provides accessibility to the target population (Cooper & Schindler 2008).

The primary survey data were collected using the support of a market research company in April 2018. In Australia, this research company holds a database of approximately 250,000 Australian consumers with various demographic profiles (Pureprofile AU 2017). An online questionnaire was developed, and the marketing research company circulated the questionnaire to its panel of respondents. Respondents have online accounts with the research company. The survey was forwarded to respondents who meet the selection criteria. As discussed earlier, questionnaires were sent to the panel of customers of CBA who were 18 years and above and had the experience of using CBA's physical branch, mobile app and website in the last three months. These selection criteria were incorporated in the questionnaire as eligibility checks to ensure the authenticity of respondents. Respondents who passed the eligibility checks could complete the surveys. Respondents are paid for completing the whole survey by the marketing research company. Results of the survey were accessible through the marketing research company's online platform.

5.5.4 Sample Profile

In total, 1888 responses were attempted. Although a lot of the responses didn't meet the eligibility check of using three different channels of the bank within the last three months. And thus, after the eligibility check, 596 responses were retained. Respondents below 18 years old and customers who do not have experience of using all three channels, i.e., mobile app, website and physical branch of CBA in the last three months were eliminated. Furthermore, two attention check questions (ACQs) have been placed between the questionnaire to ensure data quality. Recent studies have demonstrated that ACQs are used to analyse respondents who are not paying attention or to raise respondents' focus. Therefore, they help enhance data collection performance (Aust et al. 2013; Buhrmester et al. 2011; Oppenheimer et al. 2009; Peer et al. 2014). 254 respondents failed to answer

the ACQs correctly. Hence, 342 respondents remained who completed the full questionnaires. Flatlines and speeders were checked manually. Finally, a list of 301 (15.9%) valid responses were used for final analysis.

Respondent's demographic profile represents diverse groups as illustrated below: (see Table 5-3).

Table 5-2 Respondents' Demographic Profile

Gender		Age		Annual Income (in AUD)	
Male	52%	Under 18 years old		Under $18,200	15.61%
Female	48%	18 - 24	13.3%	$18,201 – $37,000	22.92%
		25 - 34	29.6%	$37,001 – $87,000	36.21%
		35 - 44	19.9%	$87,001 – $180,000	22.92%
		45 - 54	16.9%	180,000 and above	2.33%
		55-64	11.0%		
		Over 64 years old	9.3%		

Employment		Education	
Employed full time	46.50 %	Year 11 or below	15.00%
Employed part-time	18.90 %	Year 12	16.90%
Unemployed looking for work	3.00%	Certificate III/IV	13.30%
Unemployed not looking for work	7.30%	Advanced Diploma and Diploma	27.20%
Retired	12.00 %	Bachelor’s Degree	7.00%
Student	7.30%	Graduate Diploma and Certificate	9.00%
Other	5.00%	Master’s Degree	9.30%
		Doctorate	2.30%

5.6 Measurement Development

To restrict measurement errors, an accurate and valid research instrument must be designed (Churchill 1979; MacKenzie et al. 2011; Moore & Benbasat 1991; Straub 1989). The next section discusses the steps of research instrument development which is further explained in Chapter 6.

5.7 Reliability and Validity

The research instrument should be tested by a quantitative procedure to assess the reliability and validity of the sample questionnaire (Hair, Black, et al. 2013). For instrument development, it is crucial to evaluate content validity, construct validity and reliability (Gefen et al. 2000; Hair et al. 2017; MacKenzie et al. 2011; Straub et al. 2004; Wong 2019). This study follows the guideline as advised by the above studies to measure content validity and reliability, convergent validity and discriminant validity. These are described in the next section.

5.7.1 Reliability

Reliability pertains to examining the accuracy and repeatability of the measurement scales (Hair et al. 2017). It is *"the extent to which the respondent can answer the same questions or close approximations the same way each time"* (Straub et al. 2004, p. 400).

Cronbach's alpha coefficient (Cronbach 1971) and composite reliability (CR) (Chin 2010; Hair et al. 2017; Straub et al. 2004) are used to calculate the reliability of internal consistency or **internal consistency reliability**. The cut-off points for both Cronbach's alpha and CR are 0.70. Scales are considered reliable if they are above the cut-off point (Bagozzi & Yi 1988; Fornell & Larcker 1981; Hair, Black, et al. 2013; MacKenzie et al. 2011; Nunnally & Bernstein 1994; Straub 1989). Furthermore, reliability above 0.95 may demonstrate common method bias, while values less than 0.60 shows poor construct definition (Hair et al. 2017). In accordance with the guideline, this research calculates CR over Cronbach Alpha to measure each scale. Due to different limitations of Cronbach Alpha, such as assumption of indicators being equally reliable and sensitivity to the number of items, Hair et al. (2017) suggests using CR as internal consistency reliability, which this research undertakes.

Furthermore, this research also measures **indicator reliability** for all the items. To confirm indicator reliability, all the items should be statistically significant and standardised outer loadings commonly should be 0.708 or higher (Hair et al. 2017; Sarstedt et al. 2017). Although, a weaker outer loading (from .40 to .70) of the construct can be retained with careful examination of its impact on the composite reliability and content validity (Hair et al. 2017).

5.7.2 Validity

Validity means the examination of an item of a construct to determine whether the item is a valid measure of it or not and whether the item fits the conceptual definition or not (Hair, Black, et al. 2013; MacKenzie et al. 2011). For empirical research, content validity and construct validity should be ensured (MacKenzie et al. 2011; Straub et al. 2004). Furthermore, to measure construct validity, research needs to ensure convergent validity and discriminant validity (MacKenzie et al. 2011). These are discussed in the next section:

5.7.2.1 Content validity

Content validity corresponds to the extent to which an item of a construct can capture what it was supposed to test (Hair, Black, et al. 2013). It is defined as *"the degree to which items in an instrument reflect the content universe to which the instrument will be generalized"* (Straub et al. 2004, p. 424). According to MacKenzie et al. (2011), content validity determines whether or not an item forms a component of the construct's domain, and whether or not the items as a group jointly reflect the entire domain of a construct's content.

Content validity can be confirmed by adopting items from questionnaires available in the literature and conducting a pre-test where instruments are judged based on

appropriateness and comprehensiveness by a different panel of experts (Straub et al. 2004). Accordingly, this research adopted measures from reliable sources in literature and conducted a pre-test to examine the appropriateness of the questionnaire. These are further discussed in Chapter 6.

5.7.2.2 Construct validity

Construct validity corresponds to the link between the measuring method and the theoretical definition (Straub et al. 2004). It answers the fundamental question *"whether the measures chosen by the researcher 'fit' together in such a way so as to capture the essence of the construct"* (Straub et al. 2004, p. 15). Construct validity consists of discriminant validity and convergent validity. Convergent validity is when two or more items of the same construct are in agreement. According to Gefen and Straub (2005) and Fornell and Larcker (1981):

1. All indicator factor loading should be above 0.70 and are significant at 0.05.

2. Average variance extracted (AVE), which is a calculation of variance between a set of items of the same construct (Fornell & Larcker 1981) should be above 0.50.

On the contrary, discriminant validity is accomplished when items are theorised to determine a particular construct differ from other constructs (Straub 1989). Thus, discriminant validity is attained when measurement items load more strongly on the theorised construct compared to other constructs (Fornell & Larcker 1981; Hair et al. 2017). Second, the AVE should exceed the squared correlation between the factor correlation matrix and any other construction considered for each construct (Fornell & Larcker 1981; Hair et al. 2017). Following these guidelines, this study assesses convergent and discriminant validity. These are discussed further in Chapter 7.

5.8 Data Analysis

This section deals with the approaches used in the data analysis for the study. First, this section describes the statistical method, i.e., structural equation modelling (SEM) - partial least squares (PLS) which are used in this study. Second, the justification for using PLS-SEM is offered in this section. Third, this section explains the procedures for factor analyses and the techniques that have been used to assess the measurement model. Finally, the section describes the techniques that have been used to evaluate the structural model.

5.8.1 Structural Equation Modelling

To evaluate the effects of inter-construct relationship of the conceptual model and to assess the overall fit of the structural model, this study uses structural equation modelling (SEM) (Chin 1998; Hair et al. 2017; Kline 2015). SEM aid to incorporate indirectly measured, unobservable variables by indicator variables. It also enables to address measurement errors in observed variables (Chin 1998). SEM typically covers two processes: measurement model analysis and structural model analysis. The measurement model explains the measurement properties such as the reliabilities and the validities of the observed variables. Furthermore, the measurement model specifies the estimation of the latent variables and the hypothetical constructs in reference to the observed variables. The structural model determines the causal relations among the latent variables. It further explains the causal effects and the level of unexplained variance (Chin 1998; Hair et al. 2017; Sarstedt et al. 2017).

SEM offers several benefits to conduct multiple regression and path analysis over other methods (Chin 1998; Gefen et al. 2011; Goodhue et al. 2012; Hair et al. 2012; Kline 2015). Path analysis implies that the underlying constructs and the scales used to calculate

the latent variables are equal. SEM evaluates the reliability of each of these analysed latent variables. In addition, taking structural equations into consideration, the modelling of unexplained variances is achievable under SEM. Finally, SEM provides overall fit evaluations which can summarise the complex models, as is the case in this study (Chin 1998; Gefen et al. 2011; Goodhue et al. 2012; Hair et al. 2012; Kline 2015). Hence the use of SEM in this thesis was deemed suitable.

SEM has two main approaches: the variance-based approach or partial least squares (PLS) and the covariance-based approach (CB-SEM), such as LISREL and AMOS (Chin 2010; Goodhue et al. 2012; Tenenhaus et al. 2005; Wetzels et al. 2009). Both PLS and CB-SEM were commonly used in past research. CB-SEM is used mainly to validate (or reject) hypotheses (i.e., a series of formal interactions that can be empirically evaluated between multiple variables). It is done by evaluating how well the covariance matrix for a sample data set can be estimated by the theoretical model suggested. PLS-SEM, on the other hand, is principally used in exploratory research to develop theories. It does so by focusing on examining the model to describe the variance in dependent variables (Hair et al. 2017).

5.8.2 Why this Study Chose PLS-SEM?

Partial least squares structural equation modelling (PLS-SEM) has progressed considerably since its application to applied business research by Wynne W. Chin (Chin 1995, 1998). Advancements in the area of new estimators (Dijkstra & Henseler 2015; Dolce et al. 2018; Schuberth & Cantaluppi 2017) and model assessment metrics (Aguirre-Urreta & Rönkkö 2018; Henseler et al. 2016; Sharma et al. 2017) to complementary methods (Hult et al. 2018; Schlittgen et al. 2016) and textbooks (Garson 2016; Hair et al. 2017; Wong 2019) have significantly expanded the methodological technique of

researchers and have contributed considerably to the independent use of PLS-SEM instead of covariance-based SEM.

For several factors, this study uses PLS-SEM. First, PLS-SEM is apt for predictive analysis (Chin 2010; Hair et al. 2012), which is the main aim of this analysis. PLS-SEM is successful if the theoretical basis of a thesis is modified early (Chin 1998). As multichannel integration quality is still mostly unexplored, PLS-SEM is more suited for this study. It also identifies the relationships between the conceptual factors and the measures of each underlying construct (MacKenzie et al. 2011). Furthermore, according to several studies it is stated that PLS is suitable for development of theory, which is also the case for this research (Gefen et al. 2011; Goodhue et al. 2012; Hair et al. 2012).

Second, this study proposes a model of MCIQ which is hierarchical and complex. PLS is suited to test large complex model with latent variables (Chin 2010; Wetzels et al. 2009). A complex model is where 10 or more constructs and 50 or more items are present (Chin 2010). This study proposes to test a model which contains 21 latent constructs (i.e. ten first-order, four second-order, one third-order constructs, four first-order interaction construct and one second-order interaction construct) and more than 40 items. Furthermore, in recent years, PLS-SEM has become increasingly popular for analysing models with hierarchical latent variable. It is due to PLS-SEM having an improved ability to assess reliability, construct validity and nomological validity of higher-order constructs (Edwards 2001; Johnson et al. 2012; Polites et al. 2012; Ringle et al. 2012; Wetzels et al. 2009). Studies have justified the use of PLS-SEM for hierarchical analysis (Chin 2010; Edwards 2001; Wetzels et al. 2009). Becker et al. (2012) summarise how PLS-SEM studies may be reported using hierarchical latent variable models. The aim of these guidelines is to assist researchers better communicate their PLS-SEM models with

hierarchical latent variables and to facilitate reviewers in determining the suitability of these hierarchical models.

Third, PLS-SEM is justified to be applicable for relatively small sample size (Ali et al. 2018; Hair et al. 2012; Nitzl & Chin 2017; Ringle et al. 2018), and although the capability of using PLS-SEM for small sample size has faced criticism (Lee 2017), studies show that PLS-SEM yields a high level of statistical power in composite models populations (Hair et al. 2017). Furthermore, Hair et al. (2019) argue, the problem with smaller sample size lies with other issues rather than using PLS-SEM. According to Rigdon (2016, p. 600) *"it will be the nature of the population that justifies the small sample size, and not the small sample size that justifies the choice of PLS"*. Petter (2018) agrees and suggest that small sample size is not a problem for PLS rather how the researchers are using it. Furthermore, statistical calculations for formative models is not a problem for PLS but is hard for covariance-based SEM techniques (Chin 1998).

Lastly, PLS-SEM does not require that data be distributed normally (Chin 1998; Fornell & Bookstein 1982; Hair et al. 2017; Hair et al. 2011) which is the situation with this research. Researchers would analyse two distributional measures— skewness and kurtosis. Skewness tests to what degree the distribution of a variable is symmetrical. If the output distribution for a variable extends too much to the distribution's right or left end, then the distribution is defined as skewed. Kurtosis is a test of whether the frequency is too large (a very narrow range with most in-centre responses). The responses are considered as a normal distribution when both skewness and kurtosis are close to zero. A skewed distribution is when the skewness is greater than +1 or less than -1. While if kurtosis is greater than +1, then it is considered as too peaked and less than -1 is considered as too flat. Distributions that show skewness and/or kurtosis which surpass these guidelines are considered non-normal. When operating with CB-SEM, these kinds

of data normalisation is needed. However, PLS-SEM typically does not presume that the data is distributed. Nonetheless, it is important to check that the data is not too far from normal because extremely unusual data proves to be troublesome by determining the significance of the parameters. (Hair et al. 2011; Henseler et al. 2012).

5.8.2.1 Explained Variance (R^2)

To test the structural part of the research model, this study established the significance of all paths estimated (Chin 2010; Gefen et al. 2000). The study also relied on the coefficient of determination, or the explained variance (R^2), in order to check if the model achieved acceptable goodness of fit as there was no other overall parametric criterion in PLS (Chin 2010; Gefen et al. 2000). R^2 estimates the proportion of the explained variance of the dependent variable in regards to its mean that is depicted by the independent variable(s) (Gefen et al. 2000).

5.9 Statistical Considerations

Statistical rigour is critical in SEM, and, therefore, must be considered when using SEM (Gefen et al. 2011). This study considered some issues of statistical rigour, as recommended by Gefen et al. (2011). Some essential issues included the number of observed variables, common method bias, sample size and power, missing data, distribution assumptions and appropriate population (for more details, Gefen et al. (2011). The following sub-sections outline the most critical issues of statistical rigour that have been suggested in previous research: distributions assumptions and common method bias, whereas, for structural and brevity purposes, other aspects are also considered and discussed elsewhere in this thesis.

5.9.1 Distribution Assumptions

It is important to assume normality during data analysis as it assumes normal data distributions (Field 2013; Gefen et al. 2011). Generally, the multivariate normality of the results is checked using the Kolmogorov-Smirnov and Shapiro-Wilk tests as well as by standard skewness and kurtosis measures for the observed variables (Gefen et al. 2011; Hair, Black, et al. 2013). Researchers indicate that if the skewness and kurtosis measures are within the +2 to -2 range, a data set is normally distributed; whereas others show that +3 to -3 ratings for kurtosis is acceptable (Field 2013; Hair, Black, et al. 2013).

However, this study does not take the normality issue into consideration for the following reasons. Firstly, data distribution is an important issue in selecting the estimation method with CB-SEM, while PLS is not limited by the need for normally-distributed variables (Chin 1998; Gefen et al. 2011; Gefen & Straub 2005; Goodhue et al. 2012). Secondly, through confirmatory factor analysis, non-parametric Spearman correlations are used instead of Pearson correlations (Chin 1998; Field 2013; Gefen & Straub 2005). As the present study conducted a confirmatory factor analysis using PLS, there was no need to test the normality of the data.

5.9.2 Common Method Variance

Common method variance (CMV) or common method bias (CMB) is defined as "a *systematic error variance shared among variables measured with and introduced as a function of the same method and/or source*" (Richardson et al. 2009, p. 763). CMV may trigger systemic measurement errors and further bias estimates of the observable relationship between various theoretical constructs (Podsakoff et al. 2003). Researchers have highlighted the importance of evaluating the effect of CMV on the results of statistical analysis (Gefen et al. 2011). The issue of CMV has been identified as a major

methodological concern associated with survey-based studies (Malhotra et al. 2006). Some researchers have also emphasised the importance of assessing the effect of CMV on higher-order multidimensional constructs (Johnson et al. 2012). Since the survey is self-reported and obtained with cross-sectional research design via the same questionnaire during the same time period as well as the model including higher-order constructs, the effect of CMV was taken into consideration in this study (Johnson et al. 2012; Malhotra et al. 2006; Podsakoff et al. 2003).

To address the common method variance (CMV), this study applied a range of research design and statistical procedures following the guidelines of Hair et al. (2017), Henseler et al. (2016), and Hulland et al. (2018). First, as part of establishing causality through research design, this study established a psychological separation between predictors and criterion variables. Second, to encourage the free flow of responses, this study applied anonymity of survey responses. Finally, to reduce social desirability bias, this study revised wording and format of the items at the pre-test phase. As part of statistical procedures, this research applied the marker variable technique (Lindell & Whitney 2001; Williams et al. 2010).

5.10 Estimating the Higher-order Constructs

The research model involved both unidimensional and hierarchical constructs. The unidimensional construct (also referred to as a first-order construct) is defined as a construct comprising a single underlying dimension (Netemeyer et al. 2003) while the hierarchical construct, or the multi-dimensional construct, is defined as a construct involving more than one dimension (Becker et al. 2012; Edwards 2001; MacKenzie et al. 2005; Wetzels et al. 2009). In some instances, the constructs to be examined by researchers are quite complex in that they may also be operationalised to higher

abstraction levels. Higher-order models or hierarchical system models are most widely used to evaluate second-order systems comprising two-element layers (Ringle et al. 2012; Wetzels et al. 2009).

The critical advantage of hierarchical modelling is that it appropriates for less model complexity and more theoretical parsimony (Becker et al. 2012; Edwards 2001; Johnson et al. 2012). Furthermore, hierarchical modelling can be used to capture specific facets of a factor which can better capture the complexity of human perceptions (Edwards 2001). In addition, hierarchical latent variable models allow the level of abstraction in conceptual models to be matched for predictor and criterion variables (Johnson et al. 2012).

SEM links a measurement model or an outer model with a structural model or an inner model (Chin 1998; MacKenzie et al. 2011). The structural model involves the interactions among independent, dependent and latent constructs, whereas the measurement model matches the distribution of measures to latent constructs. This study proposes to test a model which contains 21 latent constructs (i.e. ten first-order, four second-order, one third-order constructs, four first-order interaction construct and one second-order interaction construct).

5.10.1 Testing for Higher-order Constructs

Different methods can be used to measure hierarchical structures or higher-order variables. To assess the higher-order constructs, this study chooses the most widely used method – the repeated indicator approach (or hierarchical component model) (Becker et al. 2012). In PLS, this process is carried out by calculating a higher-order construct using the scores of its lower-order constructs (Becker et al. 2012; Wetzels et al. 2009). This approach applies the repeated use of manifest variables (or indicators). It enables analysing the effect of the lower-order constructs on the outcomes of the higher-order

constructs. The manifest variables are used repeatedly under this technique, initially for first-order latent constructs to produce primary loading and extended for second-order latent constructs (e.g. channel-service configuration, content consistency, process consistency and assurance quality) and third-order latent constructs (e.g. MCIQ) to create secondary loadings (Becker et al. 2012; Wetzels et al. 2009).

5.11 Control Variables

Control variables (CVs) are commonly used to encapsulate factors that are typically described as inessential to the desired effect (Carlson & Wu 2012). CVs contain variables that affect our knowledge of the associations between independent and dependent variables (Atinc et al. 2012; Carlson & Wu 2012). Control variables may be pursued through experimental design or statistical means (Atinc et al. 2012). With the experimental design, the researchers constrain experimental situations to hold constant those variables that might independently affect the outcomes with manipulation, elimination or inclusion, and randomization (Atinc et al. 2012). On the contrary, statistical control involves identifying potential factors that influence the relationship of an independent variable on the dependent variable – sometimes referred to as "covariate", "confounding" and ''nuisance'' variable (Atinc et al. 2012). Carlson and Wu (2012, p. 425) identified the purposes of the statistical control as being to:

(a) estimate a ''purified'' association between variable

(b) estimate a ''controlled'' association between two variables that accounts for the results of other meaningful variables

(c) determine the incremental contribution that a variable makes to the prediction of a dependent variable after the effects of other variables have been considered

Accordingly, this study considered only the statistical inclusion control method; that is, this study examined variables that were entered as extraneous variables with a supposed relationship with the dependent variables.

5.12 Summary

The previous chapter addressed the development of the conceptual model and the hypotheses. In this chapter, the exploration of the methodological considerations was done in support of the current study. This chapter also addresses the selected research paradigm and the philosophical approach for this research. This was followed by a discussion of this study's research outline and methodological considerations. The main sections of this chapter were the research paradigm (Section 5.2); research philosophy (Section 5.3) research method (Section 5.4); data collection and sampling process (Section 5.5); measurement development (Section 5.6); reliability and validity (Section 5.7); data analysis technique (Section 5.8); statistical considerations (Section 5.9); the higher-order construct estimation (Section 5.10) and control variables (Section 5.11). The next chapter will explain the development of the instruments for this thesis and address it in depth.

Chapter 6: Research Methodology – Instrument Development[5]

6.1 Overview

The central thesis of this chapter is to develop and validate an instrument to measure multichannel integration quality within the field of service quality research. Current interest in multichannel integration quality has led to the development of scales for a few constructs. However, the literature review evidences that there is a scope of preparing a reliable and valid instrument for new dimensions to capture the entirety of multichannel integration quality. This study extends research related to multichannel integration quality by developing scales for dimensions and their sub-dimensions.

This chapter is a prerequisite for Chapters 7 and 8. Chapter 7 outlines the data analysis technique for hierarchical modelling and Chapter 8 outlines the analysis and results of the main study. This chapter is designed as follows: The instrument development process is discussed in section 6.2. The conceptual definitions of the constructs are provided in section 6.3; construct operationalisation and item generation are done in section 6.4. Content validity is discussed in section 6.5, while the measurement model is specified in section 6.6. A scale evaluation preceded in section 6.7. Finally, validation of the scale is performed in section 6.8, followed by a summary in section 6.9.

[5] An abridged version of this chapter was published in the following journal:

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6.2 Instrument Development Process

This research reflects the scale development process suggested by MacKenzie et al. (2011) and confirmatory composite analysis (CCA) procedures by Hair Jr et al. (2019) for MCIQ, as illustrated in Figure 6-1.

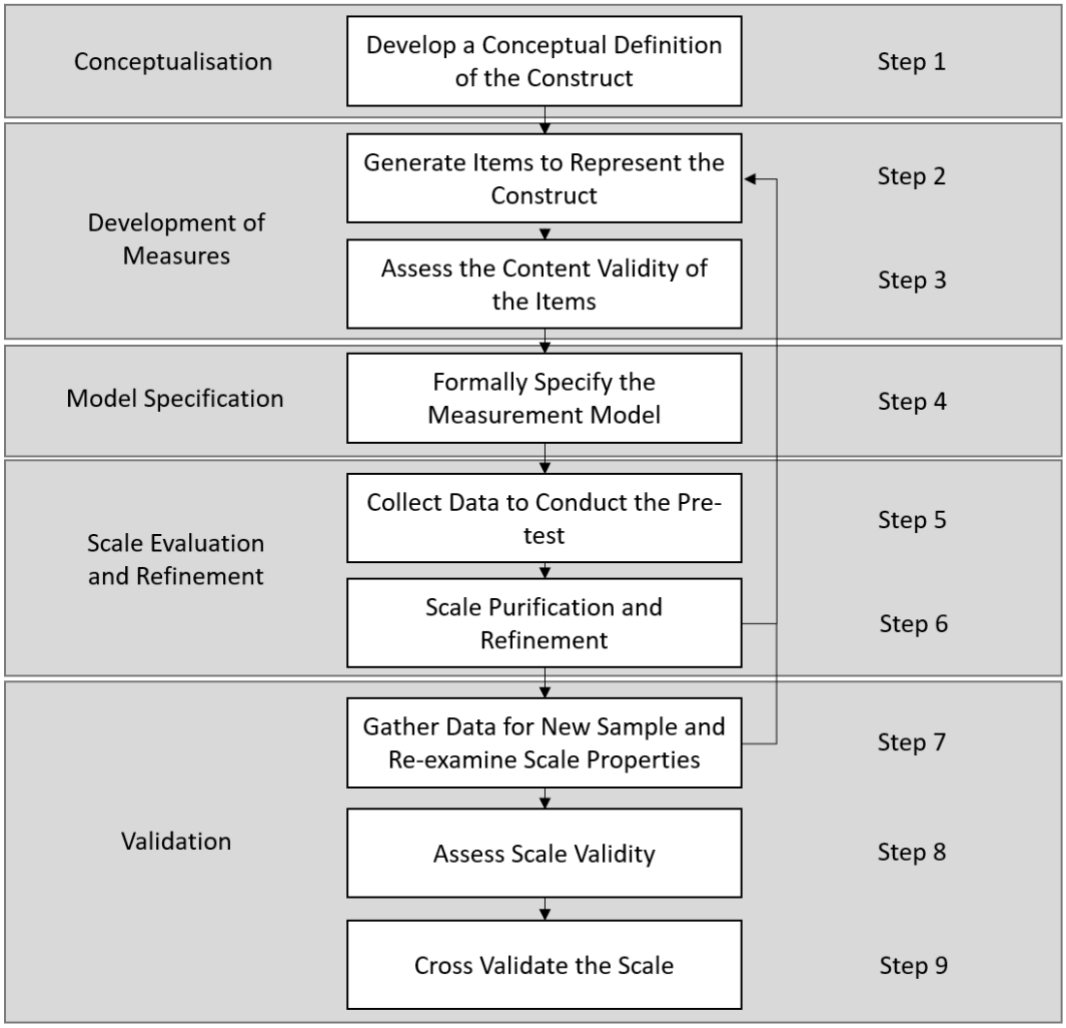

Figure 6-1 MCIQ Scale Development Procedure [adapted from (MacKenzie et al. 2011, p. 296)]

6.3 Conceptual Definition of MCIQ and its Dimensions

The instrument development process begins with the development of conceptual definitions of each construct of interest and including a list of initial items that closely match the dimensions of these construct definitions (MacKenzie et al. 2011). The

conceptual definition of MCIQ and its dimensions and sub-dimensions are illustrated in the conceptual model defined in Chapter 4 and further explained in Table 6-1. Initially, through the extant literature review, this research identified three principal dimensions and their sub-dimensions. These are channel-service configuration (breadth of channel choice, transparency of channels, appropriateness of channels), content consistency (information consistency, transaction data integration), and process consistency (system consistency, image consistency). In order to confirm the contextual appropriateness, this study conducted a qualitative analysis from 20 interviews and 2 focus group discussions (n=18). The objective of the qualitative analysis was to explore new dimensions of MCIQ and to support the initial conceptualised dimensions. Through the qualitative analysis, the fourth dimension of multichannel integration, assurance quality, and its sub-dimensions: privacy, security, and service recovery accessibility are identified as factors influencing MCIQ.

Table 6-1 Operationalisation of Constructs

Constructs	Sub-construct	Definitions	Studies
Channel-service configuration	Breadth of channel choice	Refers to having different channels available for the customer to obtain a particular service	(Hsieh et al. 2012; Madaleno et al. 2007; Seck & Philippe 2013; Sousa & Voss 2006)
	Transparency of channels	Refers to consumer awareness of different attributes of the channels	(Wu & Chang 2016) (Sousa & Voss 2006) (Bendoly et al. 2005; Oh & Teo 2010; Seck & Philippe 2013)
	Appropriateness of channels[1]	Refers to the appropriateness of services provided through specific channels	(Banerjee 2014) and Qualitative data analysis from interviews
Content consistency	Information consistency	Refers to the degree where information transmitted from the company is uniform across its channels	(Wu & Chang 2016) (Lee & Kim 2010) (Oh & Teo 2010) (Hsieh et al. 2012) (Sousa & Voss 2006)
	Transaction data integration	Refers to customers' transaction information held and used by the company are integrated and consistent within channels	(Wu & Chang 2016) (Oh & Teo 2010) (Hsieh et al., 2012)(Berman & Thelen 2004) (Sousa & Voss 2006)
Process consistency	System consistency	Refers to the system incorporated with all the channels are consistent with each other and easy to use	(Akter, D'Ambra, et al. 2013) (Parasuraman et al. 2005) (Sousa & Voss 2006)
	Image consistency	Refers to the store's brand name, slogan, colour, and logo are consistent with all other service delivery channels	(Oh & Teo 2010), (Payne & Frow 2005)
Assurance quality	Privacy[2]	Refers to the level of protection of personal information incorporated within all the channels	(Akter, D'Ambra, et al. 2013) (Parasuraman et al. 2005) (Bansal & Zahedi 2014)
	Security[2]	Refers to the safety of using different channels of the company	(Bansal & Zahedi 2014) (Montoya-Weiss et al. 2003)
	Service Recovery Accessibility[3]	Refers to providing open lines of communication to customers so that they can voice their service issues easily	(Smith et al. 2009) and Qualitative
Multichannel satisfaction		Refers to the fulfilment of customer expectation using multiple channels of the company	(Wallace et al. 2004) (Burnham et al. 2003)
	Brand Equity	Refers to customers' personal and intangible evaluation of the brand	(Vogel et al. 2008)

Customer equity	Value Equity	Refers to a customer's overall assessment of the service based on perceptions of what is received, compared to what is given	(Sweeney & Soutar 2001)
	Relationship Equity	Refers to customer evaluation of their affiliation with the company which is formed through customer-contact and corporate offerings	(Rust et al. 2004)

1 Items adapted from qualitative interviews and FGDs; 2 Items adapted from electronic service quality literature; 3 Items adapted from service recovery literature.

6.4 Construct Operationalisation and Item Generation

Construct operationalization refers to the selection of a set of measurements (also called items or indicators) that represents a theoretical construct in the best possible way. It is possible to adopt measures that have already been developed in previous studies or to develop new measures from scratch (Churchill 1979; Neuman 2013). Hence, this study adopted most of the measures from the well-established literature with minor modifications to fit the context of this study. This study also designed some new items, which are appropriate for the context. For most of the constructs, i.e., breadth of channel choice, transparency of channels, information consistency, transaction data integration and image consistency items were adopted from multichannel service quality literature (Bendoly et al. 2005; Hsieh et al. 2012; Lee & Kim 2010; Oh & Teo 2010; Seck & Philippe 2013; Wu & Chang 2016). For system consistency, privacy and security, items were adopted from electronic service quality literature (Akter & Wamba 2016; Bansal & Zahedi 2014; Parasuraman et al. 2005). Items of service recovery accessibility were adopted from service recovery literature (Smith et al. 2009). Items for appropriateness of channels were developed based qualitative analysis using the theoretical idea from multichannel service quality literature (Banerjee 2014).

Items were further refined by replacing ambiguous words. Double-barrelled and social desirability items were avoided (MacKenzie et al. 2011; Nederhof 1985). As most of these items have been used for the first time in MCIQ context, they have been tested for reliability and validity (see section 6.8). Table 6-2 present and describe the initial items created for this study and their source. Some of the constructs contain less than three items, this research uses PLS-SEM as PLS-SEM less restrictive for measurement properties of constructs with fewer items (e.g., one or two) compared to CB-SEM (Hair et al. 2011).

Table 6-2 Initial Items Created

Constructs/Items	Items in Literature	Adapted Items	Sources
Breadth of Channel			
BRDC_1	The bank offers me enough channels to realize bank transactions.	The bank offers me multiple channels to access its services.	(Seck & Philippe 2013)
BRDC_2	I can easily get access to different channels	It is easy to access different channels of the bank.	(Hsieh et al. 2012)
BRDC_3	I can always use some other channels when I am not available for the certain channel.	I can always use some other channels when I cannot access a certain channel of the bank.	(Hsieh et al. 2012) (Madaleno et al. 2007)
BRDC_4	I can choose among a range of channels when dealing with [company].	I can choose amongst a range of channels when dealing with the bank.	(Madaleno et al. 2007)
Transparency of Channel			
TRNC_1	I am aware about the attributes of the company's online and offline stores.	I am aware of the service features provided by the bank's multiple channels (website, physical branch and mobile app).	(Wu & Chang 2016)
TRNC_2	I know how to utilise attributes of both online and offline stores of the company to meet my needs.	I know how to utilise the features of the bank's multiple channels to meet my needs (website, physical branch and mobile app).	(Wu & Chang 2016)
TRNC_3	Bank informed me well about various features of the channels.	The bank informed me well about various features of their multiple channels (website, physical branch and mobile app).	(Seck & Philippe 2013)
Appropriateness of Channel			
APRC_1		The bank does not force me to use a specific channel for a specific purpose.	Interview
APRC_2		Overall, services provided through the bank's different channels are appropriate for those channels.	Interview
Information Consistency			
INFC_1	The store provides consistent product information between the two channels.	The bank provides consistent information about its service features across multiple channels (website, mobile app and physical branch).	(Wu & Chang 2016) (Lee & Kim 2010) (Oh & Teo 2010) (Hsieh et al. 2012)
INFC_2	The store provides consistent pricing policy between the two channels.	The bank provides consistent information about its service fees across multiple channels (website, mobile app and physical branch).	(Oh & Teo 2010) (Lee & Kim 2010) (Wu & Chang 2016)

INFC_3	The store provides consistent promotional information between the two channels.	The bank provides consistent information about its promotional offers across multiple channels (website, mobile app and physical branch).	(Lee & Kim 2010) (Wu & Chang 2016)
INFC_4	Overall, information across the channels I've used is consistent	Overall, information across the bank's multiple channels is consistent.	(Hsieh et al. 2012)
Transaction Data Integration			
TRDI_1	My personal data are updated in other channels when I revise my information in one channel	After making a transaction, my transaction data are updated in all the channels of the bank (website, mobile app, physical branch).	(Hsieh et al. 2012)
TRDI_2	The store keeps an integrated purchase history of my on-line and off-line purchases.	The bank keeps a history of transactions that I make through its different channels.	(Oh & Teo 2010)
TRDI_3	When I realize an operation through one channel (branch, website etc.), I am sure to find track of it through another channel.	When I make a transaction through one channel (physical branch, website or mobile app), I can keep track of it through another channel of the bank.	
TRDI_4	Regardless of the channel I use, people are informed about my past interactions with [company]	Regardless of the channel I use, the bank is aware of my past transactions with them.	(Madaleno et al. 2007)
System Consistency			
SYSC_1	This site is always available for business.	All the channels of the bank are available as per their advertised operation time.	(Parasuraman et al. 2005)
SYSC_2	This site is simple to use.	All the channels (website, mobile app and physical branch) of the bank are easy to use.	(Parasuraman et al. 2005) (Akter et al. 2016)
SYSC_3	The platform is flexible to meet variety of needs	All the channels (website, mobile app and physical branch) of the bank has a flexible system to meet my needs.	(Akter et al. 2016)
Image Consistency			
IMGC_1	The store's brand name, slogan, and logo are consistent both on-line and off-line.	The bank's brand name, slogan, and logo are consistent across all its channels (website, mobile app and physical branch).	(Oh & Teo 2010),
IMGC_2	I have a consistent impression of [company] regardless of the channel I use.	I have a consistent impression of the bank regardless of the channel I use.	(Madaleno et al. 2007)
IMGC_3	This website projects an image consistent with the retailer's image	The bank maintains a consistent brand image through all its channels (website, mobile app and physical branch).	(Carlson et al. 2015)
Privacy			
PRIV_1	It protects my personal information	My personal information across various channels of the bank (website, mobile app and physical branch) is protected.	(Parasuraman et al. 2005) (Akter et al. 2016)

PRIV_2	It does not share my personal information with other sites.	My personal information across various channels of the bank (website, mobile app and physical branch) is not shared with others.	(Parasuraman et al. 2005) (Akter et al. 2016)
PRIV_3	My level of concern that online companies may sell my personal / health / financial information to other companies is (very low / very high)	My financial information across various channels of the bank (website, mobile app and physical branch) is not shared with others.	(Bansal & Zahedi 2014)
Security			
SECU_1		All the channels of the bank have adequate security features.	Interview
SECU_2	How secure do you feel about doing online banking?	Overall, I feel secure about using this bank's multiple channels.	(Montoya-Weiss et al. 2003)
Service Recovery Accessibility			
RECO_1	Our customers have a variety of ways by which they can report failures (e.g., internet, telephone, fax, in-person)	If there is any service problem, I can use multiple channels of the bank to report service failure. (e.g., website, telephone, mobile app, in-person).	(Smith et al. 2009), Interview confirms.
RECO_2	We provide the means whereby customers can voice their complaints	The bank provides the means whereby I can voice my complaints.	(Smith et al. 2009), Interview confirms.
RECO_3		I am aware of the channels through which I can report service issues to the bank.	Interview
RECO_4	It is easy for our customers to notify us about problems they encounter	It is easy for me to notify the bank about problems I encounter through any channels.	(Smith et al. 2009), Interview confirms.
Multichannel Satisfaction			
MSAT_1	I am delighted with their performance.	I am delighted with the performance of all the bank's channels.	(Hyun 2009)
MSAT_2	I am happy with their performance.	I am happy with the performance of all the bank's channels.	(Hyun 2009)
MSAT_3	I am content with their performance.	I am content with the performance of all the bank's channels.	(Hyun 2009)
MSAT_4	Considering everything, the company has met my expectations	Considering everything, the bank's service delivery channels have met my expectations.	(Wallace et al. 2004) (Burnham et al. 2003), (Montoya-Weiss et al. 2003)
Brand Equity			
BRNE_1	X is a strong brand.	This bank has a strong brand image.	(Vogel et al. 2008)
BRNE_2	X is an attractive brand.	This bank has an attractive brand image.	(Vogel et al. 2008)

BRNE_3	X is a unique brand.	This bank has a unique brand image.	(Vogel et al. 2008)
BRNE_4	X is a likable brand	This bank has a likable brand image.	(Vogel et al. 2008)
Value Equity			
VALE_1		Using multiple channels of this bank saves my time	Interview
VALE_2	This product offers value for money	Using multiple channels of this bank provides me value for money.	(Sweeney & Soutar 2001)
VALE_3		Using multiple channels of this bank provides me convenience.	Interview
Relationship Equity			
RELE_1	The airline knows a lot of information about me.	The bank knows a lot of information about me.	(Rust et al. 2004)
RELE_2	This airline recognizes me as being special.	The bank identifies me as a valuable customer.	(Rust et al. 2004)
RELE_3		I would like to continue my relationship with this bank.	Interview

6.5 Content Validity

Content validity helps to determine how well the selected items represent the domain, (or at least its major aspects) of the latent concept in the study (Hair et al. 2017). To determine whether an item belongs to a construct domain and all the items together represent a construct domain, this research used Q-methodology (Van Exel & De Graaf 2005) and item matrix vs. construct rating suggested by MacKenzie et al. (2011). A convenient sample of five academics was chosen. All items were grouped and arranged horizontally, and the columns reflected the dimensions of the MCIQ. All respondents correctly attributed the set of items to their respective dimensions and conveyed the adequacy of the collection of items. After further discussions with the reviewers, minor improvements to the language of the items were fully incorporated in the instruments.

6.6 Specifying the Measurement Model

After analysing definition, dimensions and items that enable to determine MCIQ, this research has further identified MCIQ as be a higher-order multidimensional construct. MCIQ is a third-order construct having four second-order constructs, i.e., channel-service configuration, content consistency, process consistency and assurance quality and ten first-order constructs, i.e., breadth of channel choice, transparency of channels, appropriateness of channels, information consistency, transaction data integration, system consistency, image consistency, privacy, security, and service recovery accessibility. Furthermore, the outcome of MCIQ consists of three first-order dimensions, i.e., brand equity, value equity and relationship equity which represents one 2nd order dimensions customer equity. Customer equity and MCIQ is mediated by one first-order dimension multichannel satisfaction.

The research uses a repeated indicator approach as guided by Becker et al. (2012). It estimates the entire constructs simultaneously instead of having separate estimates for lower-order and higher-order constructs (Becker et al. 2012). The study specifies the mode of measurement as reflective-formative as the first-order dimensions are reflective (Mode A) and higher-order dimensions are formative (Mode B) (Chin 2010; Ringle et al. 2012). Becker et al. (2012) argue that for a hierarchical model, the best parameters of the path weighting scheme are produced by the repeated indicator method using reflective-formative models. In all, there are 32 indicators that enable measurement of the four dimensions and ten sub-dimensions of MCIQ. The participants were told to rate the individual items on a 7-point Likert scale, anchored at '1' designates 'strongly disagree', '7' 'strongly agree' and the mid-point '4' 'neither agree nor disagree'.

6.7 Scale Evaluation - Pre-test and Refinement

To develop the questionnaire for the items of dimensions and sub-dimensions of MCIQ, the online survey platform Qualtrics is used (Qualtrics 2019). Afterwards, three stages of pre-test were performed to refine the questionnaire. For the pre-test, the questionnaire was sent to 20 academics and higher degree research students. In the pre-test stage, the questionnaire was checked for the format, wording, clarity, understandability, completeness, question order, flow and timing. The respondents for the pre-test were requested for their feedback on the issues mentioned above and provide additional observations if they have any. The pre-test stage helped this research to fine-tune the overall questionnaire and address any formatting and wording issues it has. It is the stage where the questionnaire was formatted in a way that it is easily understandable, meaningful and logical to respondents. Several questions were fixed by using easier wording. Furthermore, questions were re-ordered so that the flow of the questionnaire is consistent. Additionally, the screening questions and exit texts were also discussed with

the pre-test respondents so that it is easy for participants to clearly understand the instructions of the questionnaire. A few questions were removed due to being redundant and to reduce overall fatigue. The target was to finalise a questionnaire which can be completed respondents within 15 minutes. The questionnaire flow was formatted accordingly upon recommendations form the pre-test respondents. The online platform Qualtrics also provided different data and insights which helped to format the questionnaire properly.

6.8 Validation - Pilot Study

A "full-scale" pilot study was undertaken as the next step in the instrument development process. After instruments were refined in the pre-test stage, the pilot-test stage was conducted to assess the likely response rates and to confirm the scales' reliability. For this stage, the questionnaire created in the Qualtrics platform was circulated to a small sample (smaller than the respondents of the main study). The participants' background and selection criteria were the same as the main study. A report, including the instruments for the study was made and approved by the University of Wollongong's Human Research Ethics Committee (HREC) before the pilot study started (see Appendix 2).

The questionnaire was circulated using a marketing research panel, as discussed in section 5.5.3. 217 potential respondents attempted the survey, and 54 of them met the qualifying criteria. The data was then gathered from the Qualtrics platform and exported in excel to perform data analysis. Speeders and flatlines were selected manually. Finally, a sample of 52 respondents was selected for pilot-test analysis.

The data analysis and findings of the pilot study are shown in the next sections. Firstly, the sampling procedure is presented. An evaluation of the characteristics of the data set

is pursued next. It then describes the methods of confirmatory factor analysis and the testing of the measurement model.

6.8.1 Pilot Sample

Following is the demographic profile of the sample for the pilot test. The sample consisted of 52 respondents with a composition of 78% female and 22% male. The dominant age group of respondents was 25-34 years, who made up 39% of the sample. Nearly 41% of the respondents hold a bachelors or higher degree. The sample further represents 63% of respondents in the workforce and having a different level of income. Respondent's demographic profile represents diverse groups as illustrated below: (see Table 6-3).

Table 6-3 Respondents' Demographic Profile

Gender		**Age**		**Annual Income (in AUD)**	
Male	22.2%	Under 18 years old		Under $18,200	16.7%
Female	77.8%	18 - 24	14.8%	$18,201 – $37,000	22.2%
		25 - 34	38.9%	$37,001 – $87,000	37.0%
		35 - 44	25.9%	$87,001 – $180,000	16.7%
		45 - 54	11.1%	180,000 and above	7.4%
		55-64	1.9%		
		Over 64 years old	7.4%		
Employment				**Education**	
Employed full time			31.5%	Year 11 or below	5.6%
Employed part-time			31.5%	Year 12	16.7%
Unemployed looking for work			5.6%	Certificate III/IV	20.4%
Unemployed not looking for work			5.6%	Advanced Diploma and Diploma	16.7%
Retired			11.1%	Bachelor’s Degree	25.9%
Student			3.7%	Graduate Diploma and Certificate	7.4%
Other			11.1%	Master’s Degree	3.7%
				Doctorate	3.7%

6.8.2 Measurement Assessment

The study conducted confirmatory factor analysis (CFA) to assess the measurement quality of first-order constructs based on their reliability, convergent validity and discriminant validity (MacKenzie et al. 2011; Straub 1989). For the first step in

conducting CFA, the measurement model was loaded in the Smart PLS 3.0 software. This model was the base model containing 46 items. Results of the base model are presented below in Table 6-4.

Table 6-4 First reliability evaluation

Items	Pilot		Pilot Refined
BRDC_1	0.847	Keep	0.861
BRDC_2	0.786	Keep	0.822
BRDC_3	0.813	Keep	0.826
BRDC_4	0.696	Drop	
TRNC_1	0.846	Keep	0.917
TRNC_2	0.885	Keep	0.927
TRNC_3	0.560	Drop	
APRC_1	0.797	Keep	0.794
APRC_2	0.925	Keep	0.927
INFC_1	0.821	Keep	0.822
INFC_2	0.896	Keep	0.896
INFC_3	0.834	Keep	0.834
INFC_4	0.810	Keep	0.810
TRDI_1	0.839	Keep	0.839
TRDI_2	0.898	Keep	0.898
TRDI_3	0.888	Keep	0.888
TRDI_4	0.815	Keep	0.815
SYSC_1	0.774	Keep	0.776
SYSC_2	0.895	Keep	0.895
SYSC_3	0.853	Keep	0.851
IMGC_1	0.821	Keep	0.822
IMGC_2	0.896	Keep	0.895
IMGC_3	0.928	Keep	0.928

Items	Pilot		Pilot Refined
PRIV_1	0.893	Keep	0.895
PRIV_2	0.960	Keep	0.960
PRIV_3	0.935	Keep	0.934
SECU_1	0.960	Keep	0.960
SECU_2	0.943	Keep	0.944
RECO_1	0.848	Keep	0.872
RECO_2	0.910	Keep	0.931
RECO_3	0.649	Drop	
RECO_4	0.872	Keep	0.903
BRNE_1	0.655	Drop	
BRNE_2	0.921	Keep	0.914
BRNE_3	0.745	Keep	0.760
BRNE_4	0.876	Keep	0.912
RELE_1	0.418	Drop	
RELE_2	0.898	Keep	0.920
RELE_3	0.907	Keep	0.929
VALE_1	0.856	Keep	0.856
VALE_2	0.889	Keep	0.890
VALE_3	0.851	Keep	0.851
MSAT_1	0.930	Keep	0.930
MSAT_2	0.962	Keep	0.961
MSAT_3	0.940	Keep	0.940
MSAT_4	0.945	Keep	0.946

To ensure reliability, items were removed from the analysis if its loading was less than 0.7 (Hair et al. 2017; Sarstedt et al. 2017). The first reliability test showed that all the indicators of the original model had loadings equal to or above 0.7 except for five items; that is BRDC_4, TRNC_3, RECO_3, BRNE_1, RELE_1 (see Table 6-4). Therefore,

these items were dropped and not included in the future model analysis. Removing these items improved the reliability scores of the relevant constructs.

In the second stage, CFA was repeated using the refined 41 items which demonstrated the second reliability and construct validity test. This study examined the reliability of all latent constructs using composite reliability (CR) (as discussed in Chapter 5, Section 5.6.1). Table 6-5 shows that all the scales were reliable, as the CR of all constructs exceeded the 0.70 cut-off value (Fornell & Larcker 1981).

Convergent validity estimates the consistency across the indicators. To examine the convergent validity, this study used the rules suggested by Hair et al. (2017) and Fornell and Larcker (1981) (as discussed previously in Section 5.7.2). In PLS, the statistical significance of indicators can be determined by the t-value which is estimated using a bootstrap standard error procedure (Chin 1998; Hair et al. 2017; MacKenzie et al. 2011; Sarstedt et al. 2017). A t-value is significant if it is above 1.95, 2.68 and 3.29 at alpha protection levels of 0.05, 0.01 and 0.001 (Malhotra 2019), respectively. In this phase, the t-value was calculated through a bootstrap resampling procedure using 5,000 samples (Chin 2010; Gefen & Straub 2005; Hair et al. 2017; Sarstedt et al. 2017). As shown in Table 6-5, all estimated standard loadings were significant (t-value > 1.96; $p < 0.001$) and of acceptable magnitude (Nunnally & Bernstein 1994). The average variance extracted (AVE) was greater than 0.60 in all cases, which exceeded the 0.50 cut-off value, thus suggesting good convergent validity.

Table 6-5 Results of confirmatory factor analysis and descriptive statistics of first-order measurements (Pilot study)

	Loading	**CR**	**AVE**
Breadth of Channel		**0.875**	**0.700**
BRDC_1	0.861		

BRDC_2	0.822		
BRDC_3	0.826		
Transparency of Channel		**0.919**	**0.850**
TRNC_1	0.917		
TRNC_2	0.927		
Appropriateness of Channel		**0.853**	**0.745**
APRC_1	0.927		
APRC_2	0.794		
Information Consistency		**0.906**	**0.707**
INFC_1	0.822		
INFC_2	0.896		
INFC_3	0.834		
INFC_4	0.810		
Transaction Data Integration		**0.919**	**0.741**
TRDI_1	0.839		
TRDI_2	0.898		
TRDI_3	0.888		
TRDI_4	0.815		
System Consistency		**0.879**	**0.709**
SYSC_1	0.776		
SYSC_2	0.895		
SYSC_3	0.851		
Image Consistency		**0.913**	**0.779**
IMGC_1	0.822		
IMGC_2	0.895		
IMGC_3	0.928		
Privacy		**0.950**	**0.864**
PRIV_1	0.895		
PRIV_2	0.960		
PRIV_3	0.934		
Security		**0.951**	**0.906**
SECU_1	0.960		
SECU_2	0.944		
Service Recovery Accessibility		**0.929**	**0.814**
RECO_1	0.872		
RECO_2	0.931		
RECO_4	0.903		
Brand Equity		**0.899**	**0.748**

BRNE_2	0.914		
BRNE_3	0.760		
BRNE_4	0.912		
Value Equity		**0.900**	**0.749**
VALE_1	0.856		
VALE_2	0.890		
VALE_3	0.851		
Relationship Equity		**0.922**	**0.855**
RELE_2	0.920		
RELE_3	0.929		
Multichannel Satisfaction		**0.971**	**0.892**
MSAT_1	0.930		
MSAT_2	0.961		
MSAT_3	0.940		
MSAT_4	0.946		

To test discriminant validity, this study used Fornell and Larcker (1981's) criteria (discussed previously in Section 5.7.2.2). This study calculated the square root of the AVEs in the diagonals of the correlation matrix (see Table 6-6). These values were greater than the correlations of the construct with the other constructs (Chin 2010; Fornell & Larcker 1981; Hair et al. 2017; Hair, Ringle, et al. 2013; MacKenzie et al. 2011). This examination indicated that each item loaded more on its respective construct than on other constructs. These results suggested that the items shared more common variance with their own constructs than with other constructs, thus confirming the discriminant validity of the first-order constructs (Chin 2010; Fornell & Larcker 1981; Hair et al. 2017; Hair, Ringle, et al. 2013; MacKenzie et al. 2011).

Table 6-6 Correlations of the first-order measurement model (pilot study) *

	Appropriateness of Channel	Brand Equity	Breadth of Channel	Image Consistency	Information Consistency	Multichannel Satisfaction	Privacy	Relationship Equity	Security	Service Recovery Accessibility	System Consistency	Transaction Data Integration	Transparency of Channel	Value Equity
Appropriateness of Channel	0.863													
Brand Equity	0.251	0.865												
Breadth of Channel	0.426	0.296	0.837											
Image Consistency	0.430	0.374	0.515	0.883										
Information Consistency	0.452	0.345	0.200	0.429	0.841									
Multichannel Satisfaction	0.487	0.625	0.428	0.526	0.466	0.944								
Privacy	0.206	0.314	0.044	0.202	0.283	0.360	0.930							
Relationship Equity	-0.045	0.640	0.166	0.224	0.223	0.463	0.314	0.925						
Security	0.451	0.323	0.248	0.338	0.447	0.644	0.633	0.194	0.952					
Service Recovery Accessibility	0.300	0.377	0.329	0.477	0.400	0.592	0.321	0.545	0.406	0.902				
System Consistency	0.438	0.344	0.511	0.521	0.341	0.395	0.193	0.135	0.178	0.227	0.842			
Transaction Data Integration	0.503	0.285	0.616	0.490	0.334	0.478	0.259	0.013	0.440	0.239	0.489	0.861		
Transparency of Channel	0.282	0.114	0.451	0.417	0.162	0.206	0.104	0.046	0.077	0.142	0.592	0.483	0.922	
Value Equity	0.304	0.252	0.270	0.204	0.292	0.385	0.085	0.083	0.393	0.203	0.225	0.383	0.066	0.866

* √AVE on the diagonal.

In general, the measurement assessment for all first-order factors was considered adequate with the confirmation of satisfactory reliability (α and CR > 0.70) and convergent validity (AVE > 0.50, significant loadings > 0.70, $p < 0.001$) (see Table 6-5) and discriminant validity AVE > correlations (see Table 6-6). All constructs were thus confirmed as satisfactory.

6.9 Summary

This chapter has outlined the procedure undertaken to develop the research instrument. Section 6.3 explained the development of the initial list of items. Section 6.4 illustrated the initial measurement refining procedures with the expert panel and described the survey design and pre-test phase. Next Section 6.5 discusses the content validity and Section 6.6 discussed the measurement model specifications (the use of reflective or formative modelling). Section 6.7 presented the pre-test and its refinements. Finally, Section 6.8 presented the pilot-test and refinement of the items via confirmatory factor analyses and the revised scales for the research model. The measurement refinement process provided some insight regarding the research model and reduced the number of underlying constructs items used in the questionnaire from 46 to 41. Overall, the pilot study was deemed acceptable with sufficient reliability (α and CR > 0.70), convergent validity (AVE > 0.50 and significant loadings > 0.70, $p < 0.001$) for all the constructs (see Tables 6-5) and discriminant validity (AVE > correlations) for the first-order constructs (see Table 6-6). As a result, all constructs were confirmed to be satisfactory and were used for the main study to assess the model parameters, predictive validity and to test the research hypotheses in the next chapter.

Chapter 7: Data Analysis and Results (Main Study)[6]

7.1 Introduction

The chapter is intended to explain the study's empirical findings. In specific, the chapter presents results of the measurement model, structural model and extended model with mediating effects, and the effects of control variables. As described in Chapter 5, this thesis applied PLS-SEM for confirmatory analysis utilising 301 responses.

Based on the thematic analysis and qualitative findings, this research proposes a model of multichannel integration quality (MCIQ). This study proposes MCIQ has four dimensions and ten subdimensions of MCIQ. The first dimension is *channel-service configuration* which consists of three sub-dimensions, i.e., *breadth of channel choice, transparency of channels,* and *appropriateness of channels*. The second dimension is *content consistency* which includes two sub-dimensions, i.e., *information consistency* and *transaction data integration.* The third dimension is *process consistency* which consists of two sub-dimensions, i.e., *system consistency* and *image consistency.* Finally, the fourth dimension is *assurance quality* which consists of three subdimensions, i.e., *privacy, security* and s*ervice recovery accessibility* as factors influencing MCIQ.

[6] An abridged version of this chapter was published in the following journal:

Hossain, TMT, Akter, S, Kattiyapornpong, U & Dwivedi, Y (2020), 'Reconceptualizing Integration Quality Dynamics for Omnichannel Marketing', *Industrial Marketing Management*, *87*, pp. 225-41.

Furthermore, through literature review, this research proposes *customer equity* and its drivers, i.e., *brand equity, relationship equity and value equity* as outcomes of MCIQ having *multichannel satisfaction* as a mediator between MCIQ and CUEQ.

In chapter 6, this study shows the results of the pilot study. Once the pilot study was concluded, and the research instrument was fully developed, the next stage was to test the theoretical model using a large sample survey. Consequently, the aim of this chapter is to clarify the main study findings, as well as to test the research model and related hypotheses. The details enclosing the main survey are described. This is followed by in-depth data analyses of the findings and the assessment of the research model.

The chapter is set out as follows: Chapter 7.2 describes the first-order measurement model results. Section 7.2.1 and 7.2.2 points out the higher-order measurement model results. Section 7.3 discusses structural model observations with test results of the hypotheses. Section 7.4 discusses mediator roles in the research model. The roles of control variables in the research model are discussed in chapter 7.5. Section 7.6 deals with the overall results of hypotheses testing. Finally, a summary of the chapter is provided in part 7.7.

7.2 Measurement Model

7.2.1 First-order Measurement Model

The study conducted confirmatory factor analysis (CFA) using the software Smart PLS 3.0 to assess the reliability and validity of each of the first-order constructs (Table 7-1). Based on the criteria described in Chapter 5, reliability, convergent validity and discriminant validity were tested to check the adequacy of the first order-construct measures (see Section 5.7).

This research modelled all underlying constructs as reflective variables. All item loadings of the first-order model are above .70 while most of them are above .80 at significance level $P < 0.001$, indicating a strong association with respective constructs (Chin 2010; Hair et al. 2017). To measure the reliability of the constructs, this study used composite reliabilities (CR) and average variance extracted (AVE). All CRs and AVEs are above the threshold level of .80 and .50, respectively, demonstrating convergent validity (Chin 2010; Hair et al. 2017).

Next, this study assessed the first-order constructs for discriminant validity. The square roots of the AVEs (in the diagonals of Table 7-2) are higher than all the inter-construct correlations (Table 7-2) confirming discriminant validity. (Chin 1998; Fornell & Larcker 1981). Overall, the finding of this study confirms the measurement model with convergent validity (item loadings > .80), scale reliability (AVE > .50, CR > .80) and discriminant validity (√AVE > correlations) meeting all the criteria of acceptance. A cross-loading matrix for discriminant validity have been presented in Appendix 5.

Thus, the first-order measurement model was verified to be satisfactory and was used in the next parts for evaluating both the higher-order measurement model and the structural model.

Table 7-1 The first-order measurement model (main study)

		Loading	CR	AVE
Breadth of Channel			**0.875**	**0.700**
BRDC_1	The bank offers me multiple channels to access its services.	0.836		
BRDC_2	It is easy to access different channels of the bank.	0.874		
BRDC_3	I can always use some other channels when I cannot access a certain channel of the bank.	0.798		
Transparency of Channel			**0.917**	**0.847**
TRNC_1	I am aware of the service features provided by the bank's multiple channels (website, physical branch and mobile app).	0.916		
TRNC_2	I know how to utilise the features of the bank's multiple channels to meet my needs (website, physical branch and mobile app).	0.924		
Appropriateness of Channel			**0.880**	**0.785**
APRC_1	The bank does not force me to use a specific channel for a specific purpose.	0.909		
APRC_2	Overall, services provided through the bank's different channels are appropriate for those channels.	0.863		
Information Consistency			**0.924**	**0.752**
INFC_1	The bank provides consistent information about its service features across multiple channels (website, mobile app and physical branch).	0.837		
INFC_2	The bank provides consistent information about its service fees across multiple channels (website, mobile app and physical branch).	0.867		
INFC_3	The bank provides consistent information about its promotional offers across multiple channels (website, mobile app and physical branch).	0.864		
INFC_4	Overall, information across the bank's multiple channels is consistent.	0.900		
Transaction Data Integration			**0.912**	**0.721**
TRDI_1	After making a transaction, my transaction data are updated in all the channels of the bank (website, mobile app, physical branch).	0.848		
TRDI_2	The bank keeps a history of transactions that I make through its different channels.	0.853		
TRDI_3	When I make a transaction through one channel (physical branch, website or mobile app), I can keep track of it through another channel of the bank.	0.875		
TRDI_4	Regardless of the channel I use, the bank is aware of my past transactions with them.	0.819		
System Consistency			**0.874**	**0.699**
SYSC_1	All the channels of the bank are available as per their advertised operation time.	0.731		
SYSC_2	All the channels (website, mobile app and physical branch) of the bank are easy to use.	0.894		
SYSC_3	All the channels (website, mobile app and physical branch) of the bank has a flexible system to meet my needs.	0.873		
Image Consistency			**0.917**	**0.787**
IMGC_1	The bank's brand name, slogan, and logo are consistent across all its channels (website, mobile app and physical branch).	0.829		

IMGC_2	I have a consistent impression of the bank regardless of the channel I use.	0.901		
IMGC_3	The bank maintains a consistent brand image through all its channels (website, mobile app and physical branch).	0.929		
Privacy			**0.937**	**0.832**
PRIV_1	My personal information across various channels of the bank (website, mobile app and physical branch) is protected.	0.884		
PRIV_2	My personal information across various channels of the bank (website, mobile app and physical branch) is not shared with others.	0.931		
PRIV_3	My financial information across various channels of the bank (website, mobile app and physical branch) is not shared with others.	0.921		
Security			**0.960**	**0.924**
SECU_1	All the channels of the bank have adequate security features.	0.961		
SECU_2	Overall, I feel secure about using this bank's multiple channels.	0.962		
Service Recovery Accessibility			**0.906**	**0.764**
RECO_1	If there is any service problem, I can use multiple channels of the bank to report service failure. (e.g., website, telephone, mobile app, in-person).	0.818		
RECO_2	The bank provides the means whereby I can voice my complaints.	0.899		
RECO_4	It is easy for me to notify the bank about problems I encounter through any channels.	0.903		
Brand Equity			**0.910**	**0.770**
BRNE_2	This bank has an attractive brand image.	0.901		
BRNE_3	This bank has a unique brand image.	0.830		
BRNE_4	This bank has a likable brand image.	0.900		
Value Equity			**0.888**	**0.726**
VALE_1	Using multiple channels of this bank saves my time	0.889		
VALE_2	Using multiple channels of this bank provides me value for money.	0.799		
VALE_3	Using multiple channels of this bank provides me convenience.	0.866		
Relationship Equity			**0.891**	**0.803**
RELE_2	The bank identifies me as a valuable customer.	0.865		
RELE_3	I would like to continue my relationship with this bank.	0.927		
Multichannel Satisfaction			**0.958**	**0.851**
MSAT_1	I am delighted with the performance of all the bank's channels.	0.910		
MSAT_2	I am happy with the performance of all the bank's channels.	0.949		
MSAT_3	I am content with the performance of all the bank's channels.	0.905		
MSAT_4	Considering everything, the bank's service delivery channels have met my expectations.	0.924		

Table 7-2 Correlations of the first-order measurement model (main study) and AVEs*

	Mean	Standard Deviation	Appropriateness of Channel	Brand Equity	Breadth of Channel	Image Consistency	Information Consistency	Multichannel Satisfaction	Privacy	Relationship Equity	Security	Service Recovery Accessibility	System Consistency	Transaction Data Integration	Transparency of Channel	Value Equity
Appropriateness of Channel	5.87	0.94	0.886													
Brand Equity	5.74	1.23	0.379	0.878												
Breadth of Channel	5.81	1.13	0.470	0.225	0.837											
Image Consistency	6.23	0.83	0.449	0.325	0.369	0.887										
Information Consistency	5.46	1.13	0.522	0.375	0.394	0.424	0.867									
Multichannel Satisfaction	5.72	1.06	0.608	0.493	0.406	0.534	0.589	0.922								
Privacy	5.72	1.01	0.470	0.451	0.270	0.373	0.406	0.504	0.912							
Relationship Equity	5.03	1.46	0.121	0.066	0.135	-0.051	0.112	0.153	0.112	0.896						
Security	5.89	1.07	0.485	0.364	0.317	0.425	0.467	0.636	0.668	0.146	0.961					
Service Recovery Accessibility	5.48	1.19	0.562	0.393	0.352	0.404	0.458	0.565	0.400	0.262	0.412	0.874				
System Consistency	5.83	0.99	0.600	0.381	0.435	0.524	0.494	0.596	0.486	0.135	0.496	0.462	0.836			
Transaction Data Integration	6.15	0.87	0.588	0.272	0.460	0.509	0.392	0.512	0.353	0.069	0.379	0.393	0.573	0.849		
Transparency of Channel	5.63	1.16	0.529	0.273	0.505	0.391	0.403	0.432	0.316	0.094	0.344	0.375	0.556	0.484	0.920	
Value Equity	5.83	1.12	0.441	0.401	0.363	0.380	0.391	0.593	0.390	0.091	0.500	0.381	0.508	0.452	0.422	0.852

* √AVE on the diagonal.

7.2.2 The second and third-order measurement model

For the higher-order measurement model, this study calculated the relation between different inter-order, i.e., 1st order with 2nd order and 2nd order with 3rd order relationships. The second-order channel-service configuration consisted of 7 items (3 + 2 + 2), and the degree of explained variance was explained by breadth of channel (70%), transparency of channels (67%), and appropriateness of channels (63%). Similarly, content consistency consisted of 8 items (4 + 4), and the degree of explained variance was explained by information consistency (71%) and transaction data integration (68%). Process consistency consisted of 6 items (3 + 3), and the degree of explained variance was explained by system consistency (74%) and image consistency (78%). Finally, assurance quality consisted of 8 items (3 + 2 + 3), and the degree of explained variance was explained by privacy (76%), security (70%), and service recovery accessibility (53%). The third-order MCIQ construct consisted of 29 items (7 + 8 + 6 + 8). MCIQ resulted in R^2 = 1.0 because the second-order formative constructs, i.e., channel-service configuration, content consistency, process consistency, and assurance quality explained all the variance of the third-order formative MCIQ construct (Becker et al. 2012; Wetzels et al. 2009). According to Becker et al. (2012, p. 366), "when the repeated indicator approach is used, regardless of Mode A or Mode B measurement, and the higher-order construct is formative (i.e., reflective-formative or formative-formative), the lower-order constructs already explain all the variance of the higher-order construct (i.e., R2 equals 1.0)".

For the outcome variables, customer equity consisted of 8 items (3+2+2) and was explained by brand equity (69%), value equity (69%), and relationship equity (5%). The strength among inter-order constructs was shown using beta coefficients in Table 7-3. All

these path coefficients from the first-order to second-order to third-order constructs were significant at $p < 0.05$.

Since higher-order constructs were formative, the study calculated the weights of items of both the third-order MCIQ construct and the second-order constructs (channel-service configuration, content consistency, process consistency, and assurance quality). These were significant at $p < 0.001$. The study also conducted a collinearity test on the index, and the results showed the evidence of minimum collinearity among the formative items as the variance inflation factor (VIF) of all items range between 1.388 and 3.864. In the context of PLS-SEM, a tolerance value of 0.20 or lower and a VIF value of 5 and higher respectively indicate a potential collinearity problem (Hair et al. 2017; Hair et al. 2011). Hence the values are well between the cut-off points.

According to the above analyses, the results confirmed H1, H2, H3, and H4.

Table 7-3 Inter-order Relations

Third-order formative construct	Weights of items[a]	P-Value	Third – Second-order relationship	β	t-value
MCIQ	0.036 – 0.067 VIF 1.388 – 3.864	P<0.001	Channel-Service Configuration	0.254	16.995
			Content Consistency	0.319	19.108
			Process Consistency	0.251	17.639
			Assurance Quality	0.350	17.148

Second-order constructs	Weights of items		Second – First order relationship	β	t-value
Channel-Service Configuration	0.170 – 0.228	P<0.001	Breadth of Channel	0.835	28.459
			Transparency of Channel	0.819	34.550
			Appropriateness of Channel	0.794	33.235
Content Consistency	0.157 – 0.186	P<0.001	Information Consistency	0.842	47.271
			Transaction Data Integration	0.826	37.693
Process Consistency	0.189 – 0.236	P<0.001	System Consistency	0.862	53.746
			Image Consistency	0.884	58.351
	0.140 – 0.190	P<0.001	Privacy	0.874	51.252

Assurance Quality			Security	0.839	38.035
			Service Recovery Accessibility	0.725	21.570
Customer Equity	0.063-0.239	P<0.001	Brand Equity	0.830	37.222
			Relationship Equity	0.214	2.083
			Value Equity	0.831	42.333

Note: [a]Weights of items of the higher-order formative construct, i.e., third-order integration quality (29 items) and second-order channel-service configuration (7 items), content consistency (8 items), process consistency (6 items) and assurance quality (8 items)

7.3 Structural Model

Within the structural model, the study calculated the relationship strength between MCIQ, MSAT, and CUEQ. The results showcased a standardised beta of 0.371 (MCIQ - CUEQ), 0.766 (MCIQ - MSAT) and 0.372 (MSAT - CUEQ), respectively (Figure 7-1). These are significant at p <0.001 (Table 7-5). The model explained the overall variance through R^2 which is 0.587 for MSAT and 0.487 for CUEQ. Both R^2 values are above .35 and considered a large effect size according to Cohen (1988). Thus, H5, H6 and H7 precisely state that overall multichannel integration quality has a significant positive impact on MSAT and CUEQ ensuring the validity of the overall research model.

Table 7-4 R-Square Results

	R-Square	R-Square Adjusted
CUEQ	0.487	0.484
MSAT	0.587	0.586

Table 7-5 Results of Structural Model

	β /Path Coefficients	Standard Error	T-Statistics	P-Value
MCIQ - CUEQ	0.371	0.077	4.836	0.00
MCIQ - MSAT	0.766	0.024	32.174	0.00
MSAT - CUEQ	0.372	0.080	4.650	0.00

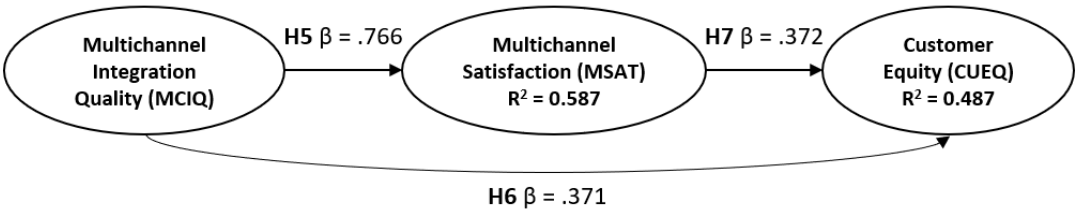

Figure 7-1 Structural Model

7.4 Mediation Analysis

The study also analysed the mediating effect of MSAT within the MCIQ-MSAT-CUEQ link using the procedure suggested by Preacher and Hayes (2008) and Hayes et al. (2011). The study bootstrapped the sampling distribution of indirect effects using 95% confidence interval. The mediating path from MCIQ via MSAT to CUEQ is the product of the path coefficients from MCIQ to MSAT and from MSAT to CUEQ, which is 0.285, significant at $p < 0.01$ (Table 7-6). Additionally, the direct effects of MCIQ-MSAT and MSAT-CUEQ are also significant at $p < 0.001$ (Table 7-6). Hence, H8 is also confirmed, providing strong support for MSAT as a partial mediator (Hair et al. 2017).

Table 7-6 Results of Mediation Testing

		β /Path Coefficients	Standard Error	T-Statistics	P-Value
Direct Effects	MCIQ - CUEQ	0.371	0.077	4.836	0.00
Indirect Effects	MCIQ - CUEQ	0.285	0.064	4.465	0.00

7.5 Control Variables

Furthermore, this study analysed the impact of the control variable (COV) on VAL. The results indicate, there is no significant impact of the control variable, i.e., as R^2 values have not been affected due to the addition of age, education, employment, gender and income as the control variables. Hence H9 is not supported.

Table 7-7 Results of Control Variable

	β /Path Coefficients	Standard Error	T-Statistics	P-Value
MCIQ - CUEQ	0.371	0.077	4.836	0.00
MCIQ - MSAT	0.766	0.024	32.174	0.00
MSAT - CUEQ	0.372	0.080	4.650	0.00

Control Model	β /Path Coefficients	Standard Error	T-Statistics	P-Value
MCIQ - CUEQ	0.357	0.080	4.474	0.000
MCIQ - MSAT	0.766	0.025	30.456	0.000
MSAT - CUEQ	0.378	0.080	4.713	0.000
Age - CUEQ	-0.068	0.044	1.572	0.117
Education - CUEQ	-0.076	0.048	1.599	0.110
Employment - CUEQ	-0.022	0.046	0.467	0.641
Gender - CUEQ	0.033	0.044	0.748	0.455
Income - CUEQ	-0.021	0.051	0.415	0.678

Finally, to address the common method variance (CMV), this study applied a range of research design and statistical procedures following the guidelines of Hair et al. (2017), Henseler et al. (2016), and Hulland et al. (2018). First, as part of establishing causality through research design, this study established a psychological separation between predictors and criterion variables; Second, to encourage the free flow of responses, this study applied anonymity of survey responses; and finally, to reduce social desirability bias, this study revised wording and format of the items at the pre-test phase. As part of statistical procedures, this study applied the marker variable technique (Lindell & Whitney 2001; Williams et al. 2010), where the variable "I do not know about Facebook" was used. It clearly shows an insignificant relationship between the original research model and the revised marker variable based research model.

7.6 Overall Findings of Hypotheses

The overall findings in relation to the hypotheses stated in Chapter 4 are as follows:

Table 7-8 Summary of Hypotheses Findings

H1: Channel-service configuration (CSCO) positively influences multichannel integration quality (MCIQ).	Supported
H2: Content consistency (CONC) positively influences multichannel integration quality (MCIQ).	Supported
H3: Process consistency (PROC) positively influences multichannel integration quality (MCIQ).	Supported

H4: Assurance quality (ASNQ) positively influences multichannel integration quality (MCIQ).	Supported
H5: Multichannel integration quality (MCIQ) positively influences multichannel satisfaction (MSAT).	Supported
H6: Multichannel integration quality (MCIQ) positively influences customer equity (CUEQ).	Supported
H7: Multichannel satisfaction (MSAT) positively influences customer equity (CUEQ).	Supported
H8: Multichannel satisfaction (MSAT) mediates the relationship between multichannel integration quality (MCIQ) and customer equity (CUEQ).	Supported
H9 (control hypothesis): Customer Equity (CUEQ) vary as per the demographic characteristics (i.e., age, education, employment, gender and income).	Not Supported

7.7 Conclusion

This chapter addressed the main study findings and brought the research model and relevant hypotheses to the test. Section 7.2 described the assessment of the measurement properties of the research model. Section 7.3 provided an examination of the structural model evaluation. Section 7.4 presented the results of the mediating hypotheses. Section 7.5 described the impact of control variables. The final section, Section 7.6, provided a summary of the overall findings of the hypothesis testing. Implications of the findings, conclusions and limitations of the research are discussed in the next chapter.

Chapter 8: Discussion and Conclusion[7]

8.1 Overview

This chapter presents the empirical findings of the current study, outlines the answers to the research questions and discusses the research hypotheses. It discusses significant contributions and the implication of the study for both theory and practice. The chapter further addresses the limitations of the research and future directions for the study and ends with concluding remarks.

The chapter is organised as follows. Firstly, the chapter presents a review of the objectives and research questions of this study (Section 8.2). This is followed by a discussion of the findings which address the answers of the research questions (Section 8.3). Then it discusses the contributions and implications of the study for both research and practice (Section 8.4). Next, the chapter discusses the limitations of the current research and provides future directions for further research (Section 8.5 and 8.6). Finally, section 8.6 provides a conclusion for the thesis.

8.2 Research Objective

To fill the knowledge gaps of multichannel service quality, this study's main objectives were to analyse service quality dimensions of MCIQ and calculate MCIQ's effect on satisfaction and customer equity. To achieve these objectives, this study utilised service

[7] An abridged version of this chapter was published in the following journal:

Hossain, TMT, Akter, S, Kattiyapornpong, U & Dwivedi, Y (2020), 'Reconceptualizing Integration Quality Dynamics for Omnichannel Marketing', *Industrial Marketing Management*, *87*, pp. 225-41.

quality theories and related concepts from service quality and multichannel research to test the hypothetical relationships among constructs. This is a pioneering study in service quality and multichannel research, exploring the dimensions of service quality and modelling the impact of overall quality on outcome constructs. The following section discusses the empirical findings that support the theoretical relationships, nature of the conceptual model and relevant hypotheses. The entire discussion addresses the two research questions proposed in Chapter 1.

8.3 Summary of Findings

This study answered two non-trivial research questions which have not been addressed nor answered satisfactorily in the domain of service quality research before. In answering these questions, the study developed and validated a context-specific, multi-dimensional, hierarchical multichannel integration quality model (MCIQ) and modelled its overall impact on multichannel satisfaction (MSAT), and customer equity (CUEQ). The current findings support the relevance of MCIQ in increasing CUEQ and MSAT for services provided within a multichannel environment. Based on integration quality dimensions proposed by Sousa and Voss (2006) and Banerjee (2014) this study developed and empirically tested a model of MCIQ dimensions and its behavioural outcomes. Overall, this study proposed a higher-order MCIQ model consisting of four primary dimensions and ten sub-dimensions. The findings of the study are synthesised in the following sections, and its implications are discussed.

8.3.1 Research question 1

What are the dimensions of multichannel integration quality?

This research presented an empirical example to answer this problem by creating a third-order service-quality model which is hierarchical and formative-reflective. To measure higher-order latent variables, this study used the repeated indicator approach as illustrated by Becker et al. (2012). The study applied PLS path modelling, in developing and validating the higher-order service quality construct (Chin 2010; Hair et al. 2017). This study shows MCIQ has four dimensions and ten subdimensions. The first dimension is *channel-service configuration* which consists of three sub-dimensions, i.e., *breadth of channel choice, transparency of channels,* and *appropriateness of channels*. The second dimension is *content consistency* which includes two sub-dimensions, i.e., *information consistency* and *transaction data integration.* The third dimension is *process consistency* which consists of two sub-dimensions, i.e., *system consistency* and *image consistency.* Finally, the fourth dimension is *assurance quality* which consists of three subdimensions, i.e., *privacy, security* and s*ervice recovery accessibility* as factors influencing MCIQ.

The findings confirmed that assurance quality had the most significant reflection of overall MCIQ, followed by content consistency. The relationship between the MCIQ dimensions and sub-dimensions is explored in the following sections with their empirical and theoretical perspectives.

8.3.1.1 Explaining Channel-service configuration with MCIQ (H1)

The empirical findings confirm channel-service configuration as a significant dimension of MCIQ which enable customers to perform the same service using different channels of the firm and to have the same level of consistency and quality level (Banerjee 2014). Channel-service configuration has an impact of $\beta=0.254$ with $p<0.001$ (Table 8-1), indicating a strong and significant association with MCIQ. This association is strongly

supported by the theory which highlights that a significant portion of MCIQ is explained by channel-service configuration in terms of breadth of channel, transparency of channels and appropriateness of channels.

The findings of this study also provided strong evidence on the significant association between channel-service configuration and its subdimensions. The first sub-dimensions of channel-service configuration is breadth of channel choice which reflected 69.7% (Table 8-1) of channel-service quality variance (R^2). It also has the highest impact on channel-service configuration β=0.835 (Table 8-1) amongst other sub-dimensions. Breadth of channel choice enables customers to select from a range of channels of the firm to avail services. It is apparent that having multiple channels available to customers is essential. Customers find it convenient to be able to use any channel of their choice to perform the same task. Overall service quality of using multichannel services depends on the number of channels available to customers. Customers use the channels which they prefer the most for given circumstances and even combine two or more channels to avail one service. Multichannel service providers should focus on utilising all possible channels starting from physical outlet to the mobile app and even mobile kiosks to provide its services to the customers. This finding is consistent with different studies of multichannel service quality (e.g., Banerjee 2014; Hsieh et al. 2012; Lee et al. 2018; Madaleno et al. 2007; Seck & Philippe 2013; Sousa & Voss 2006).

The second sub-dimensions of channel-service configuration is transparency of channels which reflected 67.1% (Table 8-1) of channel-service quality variance (R^2). Transparency of channels signifies the firm's efforts to make consumers aware of different attributes of the channels. Taking measures to inform customers about the firm's different channels and channel features, specifically when customers start their transactions with the service provider are perceived helpful by customers. It is essential

that the customers are informed of existing channels and the service capability of each channel so that they can determine which channel to avail service from. This finding is consistent with different studies of multichannel service quality (e.g., Banerjee 2014; Bendoly et al. 2005; Seck & Philippe 2013; Sousa & Voss 2006; Wu & Chang 2016).

The final sub-dimensions of channel-service configuration is appropriateness of channels which reflected 63% (Table 8-1) of channel-service quality variance (R^2). Appropriateness of channels refers to the right services suited to the channel of choice. Customers judge channels according to their service capabilities. Having inappropriate channels for services causes a waste of time and loss of trust from a customer's perspective. Firms should ensure channels that are used to deliver service are appropriate for the service context. This finding is consistent with a few studies of multichannel service quality (e.g., Banerjee 2014; Hossain et al. 2019).

Overall, the findings confirm channel-service configuration as a significant dimension of MCIQ, incorporating breadth of channel, transparency of channels and appropriateness of channels as the critical sub-dimensions in the context of multichannel service quality. These findings reflect that any improvement in any one of these subdimensions can have a significant positive impact on channel-service configuration. In other words, customers perception of service quality while using multiple channels of a firm will significantly increase if these attributes of channels are ensured. Overall, to maintain a seamless and consistent service, firms should offer different channels. Having additional channels makes it convenient for customers to avail services. It allows customers to access information freely and fulfil service needs easily. Furthermore, firms should make customers aware of channels and channel attributes. This allows customers to be familiar with firms offering and channel functionality. Customers familiar with the firm's channels can easily navigate and search for the firm's offering, resulting in higher

profitability for the firm. Finally, firms should ensure channels are appropriate for the services provided through them. Not enforcing customers to use channels they do not prefer is important to maintain customer satisfaction.

8.3.1.2 Explaining Content Consistency with MCIQ (H2)

The empirical findings confirm content consistency as another significant dimension of MCIQ in which enables firms to deliver consistent outgoing information and to integrate incoming information through different channels between the customers and the firms (Lee et al. 2018; Sousa & Voss 2006). Content consistency has an impact of $\beta=0.319$ with $p<0.001$ (Table 8-1), indicating a strong and significant association with MCIQ. This association is strongly supported by the theory, which highlights that a significant portion of MCIQ is explained by content consistency in terms of information consistency and transaction data integration.

The findings of the study also provided strong evidence on the significant association between content consistency and its sub-dimensions. The first sub-dimension of content consistency is information consistency which reflected 70.9% (Table 8-1) of content consistency variance (R^2). It also has the highest impact on content consistency $\beta=0.842$ (Table 8-1) amongst other sub-dimensions. Information consistency ensures all kind of information transmitted from the company to its consumers is uniform across its channels. Consistent information through all the service delivery channels of the firm is associated with reliability. Inconsistent information within channels reduces trust and frustrate consumers. Firms should ensure information regarding price, product descriptions, assortment details, delivery details, and promotions are consistent within all its channels. This finding is consistent with other studies of multichannel service quality (e.g., Hsieh et al. 2012; Lee & Kim 2010; Oh & Teo 2010; Sousa & Voss 2006; Wu & Chang 2016).

The second sub-dimension of content consistency is transaction data integration which reflected 68.3% (Table 8-1) of content consistency variance (R^2). Customers' transaction data such as search, purchase, order, delivery and special request in addition to demographic data, mailing and email addresses, telephone numbers, and purchase preferences should be retained within a central database to be accessed and used by all the channels. Transaction data integration enables companies to integrate these data and ensure a consistent service across multiple channels while enabling multichannel firms to cross-sell and provide personalised offers at an individual level (Godfrey et al. 2011). Firms should focus on collecting real-time customer data and integrating it within all its channels. Customers look for convenience. They want firms to provide them personalised offers from which they can easily select the best product or service option, thus, reducing the hassle of doing research on all the products and service by themselves. This finding is consistent with different studies of multichannel service quality (e.g., Berman & Thelen 2004; Hsieh et al. 2012; Oh & Teo 2010; Sousa & Voss 2006; Wu & Chang 2016).

Overall, the findings confirm content consistency as a significant dimension of MCIQ, incorporating information consistency and transaction data integration as the critical sub-dimensions in the context of multichannel service quality. These findings reflect that any improvement in any one of these subdimensions can have a significant positive impact on content consistency. In other words, customers' perception of service quality while using multiple channels of a firm will significantly increase if these attributes of channels are ensured. Overall, to maintain a seamless and consistent service, firms should offer consistent information through all its channels. It ensures outgoing information within these channels are identical, consistent and reliable. Also, information related to price, product assortment details, delivery details, and so on needs to be consistent within all the channels. Besides, firms should integrate customer transaction and other incoming

data within all the channels to offer personalised service offerings. Customer data leads to better insights regarding pricing, customer relationship management, advertising, and new product development.

8.3.1.3 Explaining Process Consistency with MCIQ (H3)

The empirical findings confirm process consistency as another significant dimension of MCIQ, which refers to the consistency of all front-office processes associated with different channels (Sousa & Voss 2006). Process consistency has an impact of $\beta=0.251$ with $p<0.001$ (Table 8-1), indicating a strong and significant association with MCIQ. This association is strongly supported by the theory, which highlights that a significant portion of MCIQ is explained by process consistency in terms of system consistency and image consistency.

The findings of the study also provided strong evidence on the significant association between process consistency and its sub-dimensions. The first sub-dimension of process consistency is system consistency which reflected 74.3% (Table 8-1) of process consistency variance (R^2). System consistency refers to customer perception of convenience, ease of use, and consistency considering the technical issues of service delivery processes within all the channels (Akter et al. 2016; Delone & McLean 2003). It is associated with navigation, search, order, payment, delivery, and return. In physical stores, system consistency refers to the convenience of finding products, ease of payment and other tangibles, while in online it is related to the website or mobile app functionality, layout, flow, and payment facilities. Customers want a firm's service delivery channels to be easy to use, self-sufficient in performing all the task and free of technical issues. This finding is consistent with other studies of multichannel service quality (e.g., Banerjee 2014; Sousa & Voss 2006).

The second sub-dimension of process consistency is image consistency which reflected 78.1% of process consistency variance (R^2) (Table 8-1). It also has the highest impact on process consistency β=0.884 (Table 8-1) amongst the other sub-dimensions. Image consistency enables companies to project a consistent image of the company through all its channels. The overall brand image of the firm should be reflected in all its channels to ensure MCIQ. Firm's brand name, slogan, colour, and logo should be consistent in all the channels (Oh & Teo 2010). In physical stores, ambient cues such as temperature, music, and surrounding colours should be reflected in online channels through typesetting, graphics, and display colours.

Overall, the findings confirm process consistency as a significant dimension of MCIQ, incorporating system consistency and image consistency as the crucial subdimensions in the perspective of multichannel service quality. These results indicate that any improvement in any of these subdimensions can have a significant positive impact on the quality of the service. In other words, customers' perception of service quality while using multiple channels of a firm will significantly increase if these attributes of channels are ensured. Overall, to maintain a seamless and consistent service, firms should offer consistent and easy to use an online and offline system. Ensuring ease of use and convenience of navigation, search, order, payment, delivery, and return using all the channels of the firm asserts convenience and is influential in multichannel usage behaviour. Furthermore, firms should provide a consistent image of the firm within all its channels. Consistent image leads to the synergy between an organisation's offline and online operations, which in turn enriches customer experience and strengthen the brand image from both offline and online channels.

8.3.1.4 Explaining Assurance Quality with MCIQ (H4)

The empirical findings confirm assurance quality as a significant dimension of MCIQ which refers to the ability to convey trust and confidence within consumers by adding different channel attributes (Parasuraman et al. 1988; Piercy 2014). Assurance quality has an impact of $\beta=0.350$ with $p<0.001$ (Table 8-1), indicating a strong and significant association with MCIQ. This dimension has the strongest association with MCIQ. This association is supported by the theory which highlights that a significant portion of MCIQ is explained by assurance quality in terms of privacy, security and service recovery accessibility.

The findings of the study also provided strong evidence on the significant association between assurance quality and its sub-dimensions. The first sub-dimension of assurance quality is privacy which reflected 76.4% of assurance quality variance (R^2) (Table 8-1). It also has the highest impact on assurance quality $\beta=0.874$ (Table 8-1) amongst other sub-dimensions. Privacy refers to protecting a customer's personal information. Consumers provide personal information online via websites and mobile apps, as well as in-store via self-service technology such as kiosks, and touchless payment, making privacy an essential element of multichannel usage. Protection of privacy or protection of personal information which is disclosed within channels are essential to customers. It is not only one channel that these concerns are raised, but privacy issues are also of concern within all the channels the customers use. Firms should ensure protecting customers personal information not only on online channels but all the channels that they use and provide information.

The second sub-dimension of assurance quality is security which reflected 70.4% of assurance quality variance (R^2) (Table 8-1). Security signifies the safety of using all the

channels of the company. Customers require security of using all the channels of the firm. In online channels, they require security against malware, hacks and other issues, while in physical stores, customers require security when transacting money and many other issues. Firms should ensure adequate security is provided in all the channels. In physical channels, security guards and security cameras ensure security, while in the online platform, a secured network, robust coding and different security measures such as password protection, two-step security verification and so on are essential.

The final sub-dimension of assurance quality is service recovery accessibility which reflected 52.6% of assurance quality variance (R^2) (Table 8-1). Service recovery accessibility offers customers the mean to voice any service issues easily through different channels. Customers facing service-related issues should be able to easily raise their concern using toll-free numbers, online chat functionalities, email and so on in an online environment. They should also be facilitated to raise service issues in-store by filling out complaint forms or just meeting with a service person. Firms should ensure customers can easily voice their service issues using different channels.

Overall, the findings confirm assurance quality as a significant dimension of MCIQ, incorporating privacy, security and service recovery accessibility as the critical subdimensions in the context of multichannel service quality. These findings reflect that any improvement in any one of these subdimensions can have a significant positive impact on assurance quality. In other words, customers' perception of service quality while using multiple channels of a firm will significantly increase if these attributes of channels are ensured. Overall, protecting personal information, having secured channels and being able to raise service-related issues through any channels ensure assurance quality. Customers will want to utilise the benefit of multichannel services and at the same time, they want to protect their personal data. This makes privacy and security of

using channels extremely important. Furthermore, service-recovery accessibility allows customers to feel more trust and confidence while using the firm's channels.

Concerning the primary dimensions, assurance quality was found to have the highest impact on MCIQ (Table 8-1) evidencing that assurance of promised quality, ensuring privacy and security and providing open channels to raise service issues are the most critical factors for customers using multiple channels. In a close second, content consistency was found to be almost equally important for multichannel integration quality as it ensures the consistency and integration of information within the offered channels. Although the results for channel-service configuration and process consistency were lower, these factors were found as significant in influencing multichannel integration quality.

Table 8-1: MCIQ and its relationship with dimensions and sub-dimensions

Third-order formative construct	Third – Second-order relationship	β	t-value	p-value
MCIQ	Channel-Service Configuration	0.254	16.995	0.00
	Content Consistency	0.319	19.108	0.00
	Process Consistency	0.251	17.639	0.00
	Assurance Quality	0.350	17.148	0.00

Second-order constructs	Second – First order relationship	β	t-value	p-value	R^2
Channel-Service Configuration	Breadth of Channel	0.835	28.459	0.00	69.7%
	Transparency of Channel	0.819	34.550	0.00	67.1%
	Appropriateness of Channel	0.794	33.235	0.00	63.0%
Content Consistency	Information Consistency	0.842	47.271	0.00	70.9%
	Transaction Data Integration	0.826	37.693	0.00	68.3%
Process Consistency	System Consistency	0.862	53.746	0.00	74.3%
	Image Consistency	0.884	58.351	0.00	78.1%
Assurance Quality	Privacy	0.874	51.252	0.00	76.4%
	Security	0.839	38.035	0.00	70.4%
	Service Recovery Accessibility	0.725	21.570	0.00	52.6%

8.3.2 Research question 2

How does multichannel integration quality perception determine multichannel satisfaction and customer equity?

To answer this question, this study modelled the impact of overall MCIQ on two endogenous constructs, that is, multichannel satisfaction and customer equity. Customer equity, in turn, consists of three sub-dimensions, i.e., brand equity, relationship equity and value equity. The results of the study confirmed strong significant associations among the latent variables in the structural model and proved the four hypotheses in the base model. Furthermore, the study examined and reported critical findings on the mediating effects of satisfaction and the effects of control variables on the research model. In the following sections, the significance of all these findings is discussed.

8.3.2.1 Explaining the relationship between MCIQ, MSAT and CUEQ (H5 to H7)

The outcomes of structural model confirm that MCIQ is a significant predictor of multichannel satisfaction (MSAT) and customer equity (CUEQ). It also confirms that MSAT is a partial mediator of MCIQ and CUEQ. Hence, ensuring MCIQ will lead to the perception of higher customer equity due to being satisfied with the quality of service.

First, the findings confirmed MCIQ as a significant predictor of multichannel satisfaction ($\beta = 0.766$). This association indicates that overall service quality is one of the significant drivers of multichannel satisfaction. Firms should provide seamless and consistent service through integrated channels to ensure customers are satisfied with availing services from the firm. Multichannel service delivery is used in a complementary fashion by customers, and each channel contributes to the global evaluation of the service of the firm (Patrício et al. 2003). Customers' evaluation of satisfaction through service quality is essential

from both online and offline channels simultaneously. Hence, firms should ensure consistent service quality not only on one channel but all the channels it offers.

Second, the findings confirmed MCIQ as a significant predictor of customer equity (β = 0.371). Customer equity results by maintaining a long-term relationship with customers using different marketing techniques (Blattberg et al. 2009; Wang, H et al. 2016). This association shows that overall service quality is one of the significant drivers of customer equity of the firm. Furthermore, customer equity consists of relationship equity, brand equity and value equity. Brand equity which is the direct and intangible evaluation of the brand by customers (Ailawadi & Farris 2017; Neslin et al. 2006; Picot-Coupey et al. 2016; Verhoef et al. 2015) has a significant association with customer equity (β = 0.830) and reflected 69% customer equity variance (R^2). This indicates, to develop customer equity, firms should work on its perception of the brand image within the customers. Ensuring the integration of channels is one of the ways of increasing the brand equity of a firm. The second sub-dimension of value equity has the strongest association with customer equity (β = 0.831) and reflected 69% of customer equity variance (R^2). It is the customer's perception of the overall service based on the evaluation of what is received, compared to what is given. It is the cost-benefit analysis from the customers' perspective. To develop customer equity firms should ensure customers perceive the value received from the service outweighs the cost associated with availing the service. Providing an integrated channel system and ensuring seamless and consistent service reduce customer cost in terms of time, money and stress, and increases the overall perception of value resulting in higher customer equity. The last sub-dimension relationship equity has a significant association with customer equity (β = 0.214) and reflected 5% customer equity variance (R^2). Although lower than the other dimensions, relationship equity has a statistically significant association without which customer equity could not be created.

Relationship equity refers to customer evaluation of their affiliation with the company and how the company puts an effort to create a long-term relationship with the customers. Having a significant association, firms must create a long-lasting relationship with customers which will enable customers to repurchase from the firm in future. Providing an integrated channel system and ensuring seamless and consistent service allows such relation as customers find it convenient and familiar to shop from the same service provider over and over ensuring higher customer equity.

Hence, through the development of integrated channel system where seamless and consistent service is provided through all the channels, firms can create a better brand image, increase the value perception and create a lasting relationship with customers. All in all, through MCIQ firms can ensure customer equity.

Finally, the findings of this study confirmed MSAT is a significant predictor of CUEQ ($\beta = 0.372$). This indicates that customer satisfied with utilising different channels of the firm results in increased customer equity. Customer equity which consists of brand equity, relationship equity and value equity increases if customers are satisfied with the multichannel system of the firm. Hence, firms should ensure the channels are easy to use, safe and provide value to customers to increase overall customer equity.

8.3.2.2 Explaining MSAT as a mediator (H8)

The findings of this study confirmed multichannel satisfaction (MSAT) and a partial mediator between MCIQ and customer equity. Here, first, MCIQ results in MSAT and in turn, MSAT results in CUEQ. The results showed MSAT is a partial mediator between MCIQ and CUEQ. As such, the mediating role of satisfaction shows the importance of measuring satisfaction separately from MCIQ when modelling the effects of quality on outcome constructs. This relationship suggests that multichannel satisfaction directly

increases with perceived multichannel service quality, which is critically essential for forming and influencing customer equity and its drivers, i.e., brand equity, relationship equity and value equity. This result also supports the primary effects model (or base model), which confirms that MCIQ has a direct impact on CUEQ and an indirect impact through MSAT. The results of this study highlight the importance of these effects in the multichannel service context using the higher-order MCIQ model.

8.3.2.3 Explaining the impact of control variables (H9)

In terms of control variables, the findings of the study examined and failed to support the effects of demographic factors on the ultimate outcome construct (i.e., CUEQ). The demographic factors included gender, income education employment and age. The demographic factors did not emerge as significant factors for customer equity because the MCIQ is not restricted to any specific age group, income level education level, specific employment or any gender of the customers. This indicates that perception of multichannel service quality and its relationship with customer equity does not vary according to gender, income education employment or age.

8.4 Contributions and Implications

The current study has adopted one of the new frontiers of service quality: MCIQ. The findings of this research offer multiple contributions to the literature. Furthermore, the findings offer theoretical and managerial implications. Theoretically, the findings of this research extend MCIQ literature by conceptualising MCIQ as a formative-reflective hierarchical construct and modelling its impact on satisfaction and customer equity. Practically, the findings of this research offer managers with a service delivery model for designing an integrated multichannel system enabling for seamless and consistent service to their customers.

This research and its conclusions provide several contributions to literature and implications for both scholars and practitioners alike. The thesis theoretically advances MCIQ work by reframing the definition of MCIQ as a hierarchical formative-reflective construct and modelling its effect on customer satisfaction and equity. From the managerial perspective, the study provides managers with a service quality model for implementing an integrated multichannel network allowing them to provide their customers with a smooth and reliable service.

8.4.1 Theoretical Implications

This study extends multichannel research by proposing and validating a third-order MCIQ model. MCIQ has been identified as a considerably important service quality component (Sousa & Voss 2006). In a holistic and inclusive perspective extending knowledge within multichannel integration quality literature is a significant advancement in scholarship. In recent years research related to multichannel integration and omnichannel marketing (discussed in section 2.5) has gained traction (Gao & Su 2017; Hossain et al. 2020; Lee et al. 2018; Rizzi & Taraporevala 2019; Shen et al. 2018). Within this scope, this research offers valuable knowledge regarding multichannel service quality. The theoretical implications of this research have a significant impact on the field of *multichannel services* and *service quality* literature in different areas.

First, service quality research has been focusing on examining quality dimensions using a single channel perspective. The literature of service quality has predominantly focused on a single-channel mindset where physical service quality and virtual service quality have been conceptualised incoherently. The difference between multi-channel service quality and single-channel perspective, that has been explored in this research is a significant contribution to the theory of multichannel service quality. This research

addresses multichannel service quality by considering channels in an integrated manner and develops quality dimensions of an integrated channel system.

Second, throughout the years, there remains a lack of research which substantiates and validates dimensions of multichannel service quality. Most research related to multichannel service quality is conceptual (Banerjee 2014; Neslin et al. 2006; Neslin & Shankar 2009; Sousa & Voss 2006; Van Bruggen et al. 2010). Several studies (e.g., Banerjee 2014; Oh & Teo 2010; Wu & Chang 2016) have indicated the importance of generating scaled items for MCIQ constructs and providing empirical evidence. However, only a few dimensions of MCIQ have been validated using quantitative measures (Hsieh et al. 2012; Lee et al. 2018; Oh & Teo 2010; Shen et al. 2018; Wu & Chang 2016). This research provides empirical evidence for the conceptual dimensions of multichannel service quality. Dimensions such as channel-service configuration, content consistency, process consistency and sub-dimensions, i.e., breadth of channel, transparency of channels, appropriateness of channels, information consistency and transaction data integration were mostly conceptual prior to this research. This study validates these dimensions and provides empirical evidence concerning MCIQ.

Third, the systematic literature review ~~and qualitative phase~~ of this research have enabled to understand the research dimensions better and allowed adding or modifying the dimensions of MCIQ. Through the systematic literature review ~~and qualitative analysis~~, this research identifies several new dimensions and sub-dimensions of MCIQ. This research is the first to address new dimensions of MCIQ such as assurance quality and its sub-dimensions, privacy, security and service recovery accessibility. Through thematic analysis, image consistency and system consistency have been identified as essential sub-dimensions of process consistency. Prior studies on MCIQ have not addressed sub-dimensions of process consistency separately.

Fourth, there is a gap in addressing the impact of multichannel service quality on consumer perception. Banerjee (2014) argues that future research on MCIQ should focus on customer perception. Following Wang, H et al. (2016)'s model of service quality, customer equity, customer satisfaction, and customer lifetime value, this study adds further theoretical rigour by framing *customer equity* as an essential outcome of MCIQ. Additionally, customer equity has been tested as a higher-order outcome of MCIQ having brand equity, value equity, and relationship equity as its drivers. This research also validates *multichannel satisfaction* as a mediator of MCIQ and customer equity which adds valuable knowledge in service quality literature.

Fifth, most research on MCIQ focuses on the phenomenon from the lens of only two channels, i.e., physical and website. This research addresses MCIQ focusing on three specific channels, i.e., physical, web, and mobile, which address the current consumer trends.

Finally, the quantitative phase enabled to test and generalise the proposed model of MCIQ. This study develops and validates an instrument for measuring MCIQ in multichannel services which is vital for scientific exploration. According to Whetten (1989, p. 491), *"the mission of theory-development is to challenge and extend existing knowledge*." The model of MCIQ proposed in this study achieves that mission and is more comprehensive than the ones suggested to date.

Overall, this research makes significant contributions to theory by putting forward the difference between using a single channel approach and multichannel approach by conceptualising and empirically evidencing higher-order MCIQ instrument. Furthermore, this research significant contributions to theory by extending knowledge regarding

multichannel service quality dimensions and outcome. This framework could be a starting point for further empirical research.

8.4.2 Managerial Contribution

An integrated channel system is one of the crucial aspects of multichannel management. This research has shown how MCIQ dimensions lead to satisfaction and customer equity. Managers need to alter channel configurations, which is a higher-level orchestration of channels ordinary capabilities to achieve integration within channels.

Numerous seminal academic and industry research from McKinsey, Forrester, Accenture, Forbes, and so on are based on multichannel management and the importance of channel integration to create a successful multichannel system (i.e., Dennis 2018; Mcglynn & Conlan 2017; McKinsey 2017; O'Grady et al. 2018). This research tackles one of the most critical issues in current managerial practice by signifying several dimensions and sub-dimensions of MCIQ. The findings of this research dig into the sub-dimensional level of MCIQ. Allocating resources and managing these areas will lead to the successful development of multichannel strategies. These dimensions of MCIQ provide managers with a diagnostic tool through which they can assess the performance of the company's multichannel system according to different factors discussed in this research. This research has collected data from the financial industry. Hence, the dimensions proposed in this research might be contextual. Application of these dimensions in other industries may require further research. Nevertheless, dimensions proposed in this research is a starting point to focus on for managers in financial industries and other industries. Managerial implication resulting from this research can be categorised in the following areas:

8.4.2.1 Channel design

Logistic capabilities remain one of the biggest concerns for multichannel managers to be able to provide seamless services across channels. Hübner, Wollenburg, et al. (2016) investigate how an integrated multichannel system evolves from a separated channel system. Managers of a multichannel system need to ensure the complete distribution, logistics, and shipping solutions so that the retailers can use their supply channel most efficiently to deliver products/services to customers on time. It is never desirable that a customer order a product online, and it is delivered from a store 50km away, whereas the product was available in a store 10km away. Successful companies have been utilising the logistic capabilities effectively and efficiently, i.e., Tesco, the U.K. retail giant, offers delivery and return within 90-minutes in London as a free service (Heckmann et al. 2012). This study sheds light on some areas of logistics fulfilment. Dimensions of multichannel integration such as system consistency and transaction data integration would facilitate overall supply chain decisions of a firm and help to analyse issues related to assortment and inventory management, IT system, delivery and return, and so on.

8.4.2.2 Marketing Strategies

This research puts forward several areas where managers can alter their marketing strategies. For example, managers might be tempted to offer services through all its available channels. However, the appropriateness of channels according to the services is an important issue for managers to address. This research has shed light on this essential factor.

Furthermore, transaction data integration remains a critical success area for businesses. Managers need to analyse customer data collected from all the channels and understand what insights to extract from these data to utilise within all the channels. The challenge for retailers is how they can use this data to create personalised offers and dynamic pricing

and offer the appropriate channel for customer equity. The idea is to provide customers with intelligent product suggestions like Amazon is doing, but in this instance, across all the channels. Managers can use location-based mobile marketing to provide special offers to customers visiting certain shopping malls. Likewise, managers can email customers a related online product after they complete a purchase in-store. American Express (Amex) utilised this strategy when they used joint promotion with Twitter and other merchants. For example, an Amex customer using the Twitter hashtag to share their purchase from selected merchants would get exclusive offers from those merchants and credit from Amex a few days later.

8.4.2.3 Technology and data integration

As customers are using several channels to complete a purchase, a massive amount of customer data is being generated within all these touchpoints. Firms are grappling with this enormous amount of data. Managers need to build an integrated information technology (IIT) system through which customer transaction data and interaction data can be linked from all the channels. To achieve this, companies need to establish a centralised data warehouse. Customer demographics, shopping, and purchase data, in addition to interaction data such as customer feedback, reviews, complaints, phone calls, and so on should be collected from all the channels and stored in the data warehouse. According to Zhang et al. (2010), traditional data collection and analysis are still cantered around individual channels. Hence, firms are yet to develop the ability to collect transaction data across channels and analyse profitability from a multichannel customer perspective. Dimensions addressed in this research, such as transaction data integration, information consistency, system consistency, privacy and security, have significant implications for developing the IT system to deal with customer data.

Despite its popularity and obvious importance in the field, many largescale companies were unable to integrate their service delivery channels successfully. Hence, this research provides valuable information regarding multichannel management. Factors proposed and validated in this research provides managers with a greater understanding of areas for successful multichannel design and planning.

Additionally, the findings showcase the significance of MCIQ as a predictor of satisfaction and customer equity. Customer equity pushes growth and profitability and enables the firm to create a long-lasting relationship with its customers. The strong mediating role of satisfaction suggests that managers should emphasise channel strategies that lead to greater satisfaction and in turn increase customer equity. Increased attention in these areas will help managers to deal with complex multichannel service situations.

Overall, the findings of this research provide managers with valuable guidelines for creating a blueprint of service management processes.

8.5 Future Research Directions

The current research focuses on multichannel service delivery and the role of integration quality within multichannel services marketing. Additional studies are required to develop a full picture of MCIQ. Furthermore, this research is limited to addressing factors influencing service delivery channels only. The broader perspective of communication channels and its complex relationship with service delivery as addressed by omnichannel retailing (Rigby 2011; Verhoef et al. 2015) are not the focus of this research. Future research, therefore, could focus on omnichannel dimensions within service quality research.

The following section discusses the four dimensions of MCIQ, i.e., *Channel-Service Configuration, Information Consistency, Process Consistency and Assurance Quality* for generating future research questions. For each dimension, this research identifies several research questions with theoretical and practical implications related to MCIQ (See Table 8-2). Thus, it provides a rich source of potential research areas within the multichannel integration context.

First, this study identified *Channel-Service Configuration* as a significant dimension of MCIQ. The findings of the study demonstrate how to ensure integration quality; firms should have different channels available for the customers, inform the customers about its available channels and channel capabilities and make sure that channels are suitable to provide specific services. Future research should utilise theories such as *internal market networks* (Achrol & Kotler 1999), *market orientation* (Kohli & Jaworski 1990; Narver & Slater 1990), *resource-based theory* (Barney 1991), *event-study methodology* (Chaney et al. 1991), and *competitive strategy* (Porter & Millar 1985) to understand issues related to channel-service configuration.

Second, the study identified *Content Consistency* as another significant dimension of MCIQ. Firms should ensure all information regarding product description, pricing, delivery details, assortment details and so on are consistent within all the channels. Furthermore, firms should extract customer data from different channels to provide seamless and personalised services, create dynamic pricing, and ensure operational excellence. Future research should focus on the firm's decision on what information should be available on each channel and the implication of having special pricing and promotion information in a specific channel.

Third, *Process Consistency* involves consistency of overall system and image within all the channels. Firms should warrant the ease of use by ensuring system quality of all the channels. Additionally, firms should assure a consistent brand image by having similar colour, logo and brand experience in all the channels. Most firms manage their channels in a siloed fashion, where services and promotional offers provided through physical channels and virtual channels are handled individually through separate teams (Zhang et al. 2010). Future research should focus on the implications of such decisions.

Fourth, *Assurance Quality*, where firms should safeguard customers personal information, ensure secured channel access and provide open lines of communication to voice service-related issues. In the realm of mining and analysing customer data, retailers need to be aware of an important issue: privacy and security concerns. Wetzlinger et al. (2017) argue that privacy and security concerns are more prominent when firms utilise data from several channels to offer personalised and digital services. Privacy and security create a 'privacy paradox' (Norberg et al. 2007) as customers will want to utilise the benefit of multichannel services and at the same time they want to protect their personal data. More research is required to comprehend the strategies multichannel retailers can adopt to mitigate these concerns and support information disclosure (Nam et al. 2006). Research can focus on utilising *privacy calculus theory* (Culnan & Armstrong 1999; Dinev & Hart 2006) and *protection motivation theory* (Maddux & Rogers 1983) to determine issues related to privacy and security within multichannel integration. In regard to service recovery, multichannel system enables firms to collect service recovery data and customer feedback from different sources. Future research could focus on how these data can be utilised to improve overall service performance.

Finally, future research can focus on addressing issues related to *overall multichannel integration*. Within this domain, developing and implementing *performance metri*cs that

consider multichannel purchase behaviour of customers should be prioritised. There is little knowledge on measuring the impact of awareness, brand image, sales and profit of one channel on another channel of the firm (Zhang et al. 2010). Managers need these metrics to assist them in analysing the performance of each marketing channel and also the interrelationship of different channels (Gensler et al. 2007). Gensler et al. (2007) used *brand switching model* (Colombo & Morrison 1989) in regards to channel loyalty to evaluate channel performance. Neslin and Shankar (2009) propose to include a *cross-elasticity matrix* to assess the impact of one channel on sales activity of another channel. Future research should also focus on channel performance measurement by using the methods mentioned above to find out the effect on different consumer behavioural aspects. Research on *consumer behavioural aspects* such as loyalty, cross-buying, customer engagement, customer lifetime value, and consumer equity can be conducted to understand how these are influenced by channel integration. Lastly, mapping MCIQ dimensions on *customer experience and customer journey stages* (Lemon & Verhoef 2016) with empirical evidence can be a fruitful research avenue.

Table 8-2: Future Research Agenda

Multichannel Integration Research Stream	Future Research Questions in Multichannel Integration Landscape	Relevant Theories
Channel-Service Configuration	**Breadth of Channel Choice:** • What is the cost of adding a new channel and whether channel integration results to a net benefit for organizations – how to measure the benefits? • How can organizations better manage functional differences of its different channels to implement an integrated channel system? • What is the implication of strategic partnerships for maintaining additional channels? What effect would it have on company brand image within channels? **Transparency of Channels:** • What are the most effective ways to inform customers about the service attributes of an organization's various channels? Should there be separate campaigns to promote a specific channel? **Appropriateness of Channels:** • Should firms enforce customers to use a specific channel for a specific purpose? Is the channel appropriate for the purpose? What are the consequences if channel usage is a burden for customers?	Internal market networks (Achrol & Kotler 1999); Market orientation (Kohli & Jaworski 1990; Narver & Slater 1990); Resource-based theory (Barney 1991); Event-study methodology (Chaney et al. 1991); Competitive strategy (Porter & Millar 1985)
Information Consistency	**Information Consistency:** • Should firms integrate all service components within all the channels or keep some services unique for specific channels? Such as, should price be the same for all channels? Should there be special promotional offers directed to a particular channel? **Transaction Data Integration:**	Resource-based theory (Barney 1991); Market orientation theory (Kohli & Jaworski 1990; Narver & Slater 1990)

	• What are the most efficient processes to collect and integrate customer transaction data from different channels? • How can clickstream data and shopping path analysis lead to analysing multichannel shopping behaviour? • How can organizations better use data and insights from multiple channels to achieve operational excellence?	
Process Consistency	**System Consistency:** • What specific inventory management, assortment management, delivery and return, and IT system are necessary to implement an efficient and integrated channel system? • Should all the channels be self-sufficient to provide all the services of the company or should some services be offered only through particular channels? What is the cost associated with making all the channels self-sufficient? **Image Consistency:** • What branding elements should be presented in all the channels to provide a consistent brand image to multichannel shoppers? • How is the brand image affected if one of the channels fails to provide a consistent image of the company?	Omnichannel distribution strategic planning framework (Hübner, Kuhn, et al. 2016)
Assurance Quality	**Privacy and Security:** • What factors influence security and privacy within multichannel usage and what steps multichannel service providers should undertake to mitigate these concerns? **Service Recovery Accessibility:** • How can firms incorporate more robust service recovery system within the available service delivery channels? • How can service recovery data and customer feedback be obtained through different channels? How can firms analyse these data to create an improved service strategy?	Privacy calculus theory (Culnan & Armstrong 1999; Dinev & Hart 2006); Protection motivation theory (Maddux & Rogers 1983); Service Recovery System (Smith et al. 2009)
Overall Multichannel	**Performance Metrics:**	Multichannel shopper behaviour (Kumar & Venkatesan 2005);

Integration Management	• What evaluation criteria and metrics should be used for cross-channel performance measurement? • How do customer analytics and multichannel strategic process influence each other? **Customer Behavioural Aspects:** • What factors affect loyalty, satisfaction, customer engagement, customer lifetime value and customer equity due to MCIQ? • How to map the dimensions of MCIQ on customer experience and customer journey stages?	Relation and transaction-oriented culture within supply-chain (McAfee et al. 2002); Customer experience and customer journey model (Lemon & Verhoef 2016).

Another crucial avenue for future research is to understand the implications of multichannel integration on B2B markets. Studies have shed some light on firm performance (Oh et al. 2012) and retailer's sales growth (Cao & Li 2015) due to the integration of channels. However, these studies are not entirely geared towards understanding factors affecting channel integration within a B2B context; rather, the impact of channel integration has been the central focus. Giant online retailers such as Amazon and Alibaba are continuously partnering with other businesses to create an online marketplace, reseller, or hybrid e-commerce model (Tian et al. 2018). While online marketplace enables suppliers to sell directly to customers via an online platform, reselling occurs when the online platform buys from the suppliers and resell to customers (Tian et al. 2018). Furthermore, platforms such as Airbnb, Uber, Booking.com and so on are networking with thousands of small and large businesses to bring their services to the end consumers. Likewise, numerous online/offline retailers are selling their products through Walmart, Best Buy and Staple's online stores which can be ordered and picked up in-store by customers. All these business models are tremendously increasing the number of B2B interactions with suppliers and resellers. Seamless integration of price, inventory details, shipping, product and service information are crucial for both parties in these situations.

Although this study addresses MCIQ dimensions in a B2B service situation, similar dimensions could be appropriate for B2B context. Oh et al. (2012) address certain issues involving channel integration within the B2B context. But still, this scant information of MCIQ within B2B calls for gathering qualitative data from business managers and generating scale items for a research instrument to understand the organisation's perspective of channel integration and its impact on businesses.

In addition, future research can focus on data collection from different countries and test the model of integration quality in other industries such as healthcare, tourism, and hospitality or retailing. Furthermore, future research can focus on distinct constructs such as customer lifetime value, loyalty, and so on, as the outcome of integration quality on service quality perception. Similarly, future research can focus on modelling integration quality utilising different moderators.

8.6 Limitations

The limitations of this study are as follows. First, the data of this research has been collected only from one country, Australia. Hence, external validity, i.e., the ability to generalise results in other countries, remains a limitation. There might be a variation in the perceptions of the components and consequences of service quality in different countries, underdeveloped, developing and developed nations, and individualistic and collectivist communities. For example, privacy and security issues might differ from one country to another. Furthermore, transaction data integration and appropriateness of channel might be perceived differently in different country or culture. Hence, other studies should take caution when replicating the model in other contexts and other countries.

Second, there is a limitation in generalising the sample of the study. The sample represents banking customers of a developed country. Thus, their preference and experience in internet and mobile banking can be different than in other countries. Furthermore, this research used a research panel to collect data from participants. Despite its obvious advantages, such as the feasibility of collecting data from a large number of participants, economical and timesaving, the research panel may not represent all types of customers. For instance, customers who are always busy and are on the run may prefer

multichannel banking, however, may not get the time to fill up a questionnaire from a research panel.

Third, this research has collected cross-sectional data or data which captures respondents' views only at a single point of time (Malhotra 2014), which remains a limitation of this study. For example, the model represents the static nature of service evaluation as the findings are confined to a single point of time. Preference for using multichannel services may change over time. Consumer knowledge and requirement may change over time in regard to multichannel usage. To gain a deeper understanding, future studies could undertake a longitudinal study to evaluate users' perceptions and evaluations of MCIQ over time.

Fourth, the study was based on self-reported data. Therefore, social desirability bias can exist in the dataset (Grimm 2010). The research took cautious steps to reduce social desirability bias by ensuring that the responses are anonymous and that the study conducts only aggregated data analysis. However, it is not possible to entirely eliminate social desirability bias in survey responses (Grimm 2010).

Finally, while the qualitative data is collected from customers using different banks, the survey data of this research is based on only one financial institution and thus may not be sufficient to generalise the conclusion when applied with other banks. Future research should focus on more companies and industries while applying the MCIQ model.

8.7 Conclusion

At the age of booming information technology, and the proliferation of channels, the importance of advancing knowledge regarding channel integration has become one of the crucial aspects of service quality research. Based on multichannel service quality theory,

this research proposed several hypotheses to model the dimensions and sub-dimensions of multichannel integration quality (MCIQ) and show its effect on multichannel satisfaction and customer equity drivers, i.e., brand equity, value equity, relationship equity.

This study conducted an exploratory analysis to examine and confirm the existing dimensions of MCIQ. Besides, the exploratory analysis was also undertaken to explore new dimensions of MCIQ. To attain this, this study conducted a systematic literature review and thematic analysis to determine the dimensions and sub-dimensions of MCIQ. Furthermore, to confirm the identified dimensions and to explore new dimensions, this study conducted a qualitative study in the form of semi-structured interviews and focus group discussions.

Based on the results of the exploratory study, this research proposed four hypotheses to examine the relation between MCIQ and its dimensions. Three more hypotheses have been proposed to examine the relationship between MCIQ and outcome constructs, and one hypothesis has been proposed to investigate the role of satisfaction as a mediator. This research used 301 online survey questionnaires from multichannel banking customers to provide statistical evidence of dimensions and outcomes of MCIQ. PLS path modelling was used to test hypothesized relations and validate the hierarchical MCIQ model and its effects on outcome constructs.

The results of this study showed multichannel integration quality as a hierarchical construct with four dimensions and ten sub-dimensions. Additionally, the results confirmed the impact of MCIQ on customer equity having multichannel satisfaction as a partial mediator. The findings confirm that multichannel integration quality and its dimensions have a significant effect on consumer's perception of service quality. These

findings on quality dynamics should help managers in creating a blueprint of an effective multichannel system beneficial for both customers and companies. Finally, from a theoretical perspective, this research extends the current knowledge of multichannel service quality by proposing new antecedents and consequences and providing empirical evidence on conceptual dimensions of MCIQ. This research has a significant contribution to existing knowledge on service quality, multichannel management, and multichannel service quality research.

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Appendices

Appendix 1: Participant Information Sheet – Qualitative Study

PARTICIPANT INFORMATION SHEET

TITLE: Integration Quality Dynamics in Multichannel Services Marketing

PURPOSE OF THE RESEARCH

This is an invitation to participate in a study conducted by researchers at the University of Wollongong. This study is a requirement for PhD by research student at the University of Wollongong. This research is related to services provided by one of the top 4 banks in Australia (ANZ, Commonwealth Bank, Westpac and NAB). The purpose is to investigate your perception towards the different channels the bank utilises (i.e. banking branch, ATM booth, mobile app, website, etc.). For example, whether the bank uses different channels properly or not, whether you feel information in all the channels are consistent or not, etc. This research aims to find out different factors related to successful channel management and how these affect a customer's perception towards the bank.

INVESTIGATORS

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METHODS AND DEMANDS ON PARTICIPANTS

If you choose to participate in the study, you will be requested to spend 45 minutes in a semi-structured depth interview at your convenient location and share your views on channel management of the bank that you are a customer of. The interview will be audio-recorded with your consent. The findings may be used in a thesis, published in academic journals, presented at conferences, used for teaching material and published in book/s. Confidentiality is assured, and you will not be identified in any part of the research. To maintain privacy and confidentiality of the conversation, interviews will be conducted in meeting rooms where overhearing of conversations is minimal. The interviewer may take hand-written notes if you do not wish to be audio-recorded.

POSSIBLE RISKS INCONVENIENCES AND DISCOMFORTS

Apart from your time, we do not foresee risks. Your involvement in the study is voluntary. You have to sign a consent form and return it to a researcher. You may withdraw your participation at any time and withdraw any data that you have provided to that point. The withdrawal of data may not be possible once the aggregate summary of the interviews is prepared. Refusal to participate in the study will not affect your relationship with the University of Wollongong (UOW) in any way. The overall process will be monitored by research supervisors at the University of Wollongong so that no breach of confidentiality occurs.

FUNDINGS AND BENEFITS OF THE RESEARCH

The research is not funded. The research may benefit managers of multichannel companies and customers by looking at factors influencing integration quality within multichannel services.

FOR FURTHER INFORMATION OR CLARIFICATIONS

If you have any questions or need additional information or clarifications, you are welcome to contact Mr Taufique Hossain, Research Student at 0426803735 or email thossain@uow.edu.au.

ETHICS REVIEW AND COMPLAINTS
The study has been approved by the Human Research Ethics Committee (Social Science, Humanities and Behavioural Science) of the UOW. If you have any concerns or complaints regarding this research, you can contact the UOW Ethics Officer at (61) 02-4221 3386 or email rso- ethics@uow.edu.au.
Thank you for your interest and participation in this study.

Appendix 2: Participant Information Sheet – Quantitative Study

ONLINE PARTICIPANT INFORMATION SHEET

TITLE: Integration Quality Dynamics in Multichannel Services Marketing

PURPOSE OF THE RESEARCH
This is an invitation to participate in a study conducted by researchers at the University of Wollongong. This study is a requirement for PhD by research student at University of Wollongong. The purpose is to investigate your perception towards the different channels (i.e. physical store, website, mobile app etc.) a company uses. For example, whether the company uses different channels properly or not, whether you feel information in all the channels are consistent or not, etc. This research aims to find out different factors related to successful channel management and how these affect a customer's perception towards the company.

INVESTIGATORS

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METHOD AND DEMANDS ON PARTICIPANTS
If you agree to participate in this study, you will be asked to complete an anonymous online survey. The first few questions in the survey will be used to assess your eligibility for participation in the study. If you are eligible to participate, the survey will take approximately 15 minutes to complete. The site we are using is qualtrics.com. You will be provided with a link to complete the online survey, at which you may access at any time convenient for you. The questions in this survey ensure that you remain completely anonymous and unidentifiable to the investigator team and UOW. The responses you provide to the questionnaire will be stored on a host server that is used by qualtrics.com. Once we have completed our data collection and analysis, we will import the data we collect to the UOW server. The data on the qualtrics.com server will then be deleted.

POSSIBLE RISKS, INCONVENIENCES AND DISCOMFORTS
Apart from your time, we do not foresee risks. Your involvement in the study is voluntary. You are allowed withdraw from the study at any point prior to submitting your completed questionnaire. Once you have submitted it, your responses cannot be withdrawn because the surveys are anonymous and therefore, we will not be able to identify yours. In the event that you wish to withdraw from the study prior to submitting your completed questionnaire, all collected data from you at that point will be destroyed and omitted from any analyses or reporting. The decision not to participate, or to withdraw from the study, will not affect any current or future relationship with UOW.

FUNDING AND BENEFITS OF THE RESEARCH
The research partially funded by UOW research student grant. The research may benefit managers of multichannel companies and customers by looking at factors influencing integration quality within multichannel services.

FOR FURTHER INFORMATION OR CLARIFICATIONS
If you have any questions or need additional information or clarifications you are welcome to contact Mr Taufique Hossain, Research Student at 0426803735 or email thossain@uow.edu.au.

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Thank you for your interest and participation in this study.

Other Supplementary Materials

Supplementary Material A: Semi-structured Interview Guide

A Semi-Structured Interview on: Integration Quality Dynamics in Multichannel Services Marketing

1. INTRODUCTION

A. Greet the respondent
B. Mention names of the investigators (candidate and supervisors) and institution involved.
C. Disclose the purpose of the research:

This research is related to services provided by one of the top four banks in Australia (ANZ, Commonwealth Bank, Westpac and NAB). The purpose is to investigate the importance of consistency and integration within the different channels the bank utilises (i.e. banking branch, ATM booth, mobile app, website, etc.). This research aims to find out different factors related to integration of these channels and how integration and consistency within channels affect a customer's perception towards the bank.

D. Briefly explain why the research is being conducted:

The study is being conducted to meet the requirements for the degree of Doctor of Philosophy. The study will collect data using interviews from respondents in order to better understand factors influencing multichannel integration. The interview process will help to generate valuable insights regarding factors influencing integration and will help managers of multichannel companies to design effective channel management system.

E. Assure the respondent that their privacy, confidentiality and other concerns will be honoured:

Any information gathered in the course of this study is confidential. No individual or organisation will be identified in any publication of the results. The only people who will have access to data are the candidate and his supervisors. You are free to withdraw from further participation in the research at any time without having to give a reason and without consequence. I will use a smart phone or audio recorder to record the interview data; however, if you would prefer that a recording device is not used, I can make notes on paper.

F. Ask respondent if s/he has any questions. If all ok, then get the respond's signature on two consent forms: give one for the respondent and retain the other.

G. Provide assurance that his/her opinions will be valued; there is no right or wrong answer; it is their insights in the incidents, events or experiences of service delivery that the interviewer is interested in.

2. INTERVIEW QUESTIONS

A. General

Interview/Focus Group #	Date	Duration
Interview Type	Start Time	
Interview Venue	End Time	

B. Demographic/ Contextual Part

Affiliated Bank: ANZ, Commonwealth Bank, NAB, Westpac
Gender: Male/Female
Age group: <=25|26-35|36-45|46-55|>55
Profession/Occupation:
Ethnic background:
Education Level: HSC | Undergraduate | Postgraduate | Doctorate | Other

C. Dimensions of Integration Quality

1. Which service delivery channels do you use of your bank?
2. What are the advantages and disadvantages of each channel?
3. Which channels do you like or dislike to use?
    - Does your bank enforce you to use any channel?
    - Is there any service in the bank that can be only done through one channel?
        - How do you feel about it? Is it appropriate?
4. Do you think the bank can offer any other channels to make banking easier with them?
    - Are you satisfied with the number of channels the bank use?
5. Does your bank use promotional materials to encourage usage of any specific channel?
6. Can you use a specific channel of the bank and avail the service in another channel?
    - Web order of cards collect in branch
    - Order appointment for personal service online
7. Please explain whether information of one channel is consistent with other channels.
    - Can you provide some examples?
8. Do you find your banking data are consistent and correct in all the channels?
9. What is your overall feeling of the bank?
10. Does the banking channel impart same image?
11. When you use the channels do you feel they are user friendly?

- Image, Process, Accessibility

12. While using different channels of your bank do you feel concerned about privacy, security, personal data hack etc.? Please explain what the concerns are (if any) or why you feel your bank's channels are safe to use.

D. Outcomes of Integration Quality

1. If the bank meets all expectations related to your multichannel usage, how will you feel?
2. If a bank involves you with their channels by using different activities, for example when you like the bank's Facebook page, when the bank provides you incentive to use specific channels, when the bank informs you regarding their different channels etc. then how you would feel?

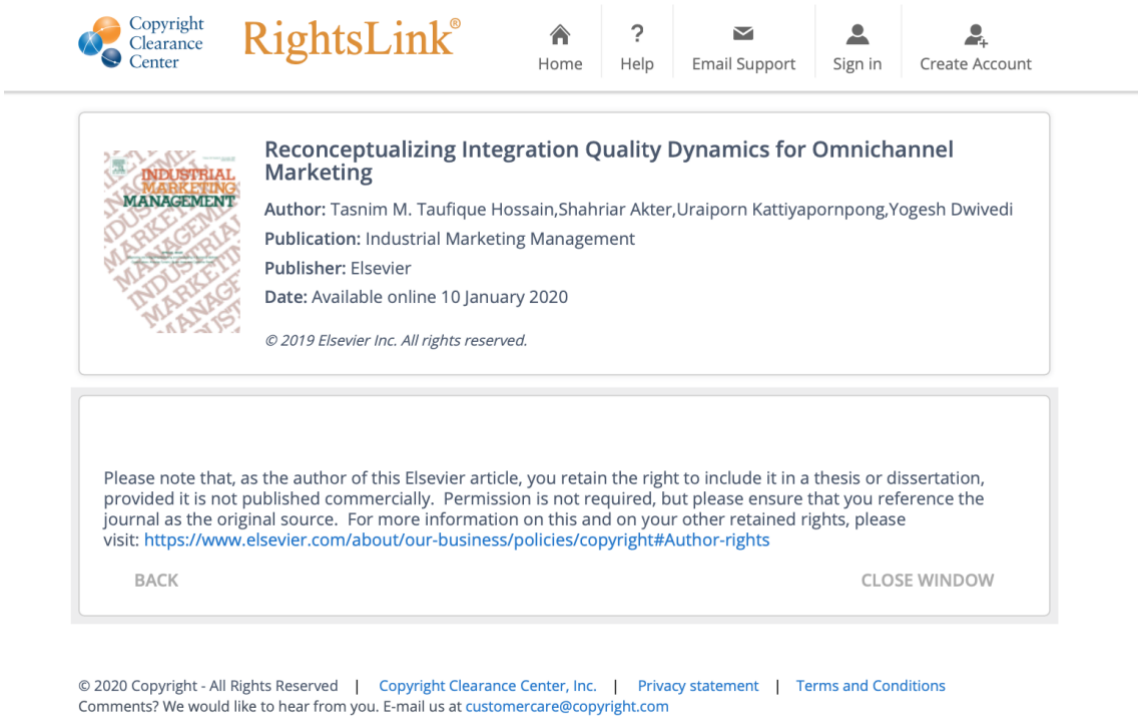
E. INTERVIEW FEEDBACK

1. What is your overall opinion about multichannel banking?
2. Would you like to see a summary of this interview and check my interpretation?

[If an interviewer says, 'Yes', then s/he will be contacted again for a follow-up check.]

F. DEBRIEF and THANK the RESPONDENT

Appendix 3: Journal Article Permission



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Multichannel integration quality: A systematic review and agenda for future research

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Appendix 4: Summary of Service Quality Models

Author(s)	Context	Proposed Dimensions		Proposed Outcomes
Grönroos (1984)	Service Quality in Physical Channel Context	Technical Quality, Functional Quality, Corporate Image		Perceived Service Quality
Parasuraman et al. (1988)		Reliability, Responsiveness, Assurance, Empathy, Tangibles		Perceived Service Quality
Rust and Oliver (1994)		Functional Quality, Technical Quality, Customer-Employee Interactions		Service Quality
Dabholkar et al. (1996)		Physical Aspect, Reliability, Personal Interaction, Problem Solving, Policy		
Frost and Kumar (2000)		Tangibility, Reliability, Responsiveness, Assurance, Empathy		Internal Service Quality
Brady and Cronin (2001)		Interaction Quality	Attitude, Behaviour, Expertise,	Service Quality
		Physical Service Environment Quality	Ambient Conditions, Design, Social Factors,	
		Outcome Quality	Waiting Time, Tangibles, Valence	
Sousa and Voss (2006)		Interpersonal Services	Routine, Customer Support	N/A
		Logistics Fulfilment	Reliability, Inventory Availability, Timeliness	
Yoo and Donthu (2001)	Service Quality in Website Context	Ease of Use, Aesthetic Design, Processing Speed, Security		
Aladwani and Palvia (2002)		Specific Content, Content Quality, Appearance, Technical Adequacy		
Barnes and Vidgen (2002)		Usability, Information, Design, Trust, Empathy		
Loiacono et al. (2002)		Informational Fit-To-Task, Tailored Communications, Trust Response Time, Ease Of Understanding, Intuitive Operations, Visual Appeal, Innovativeness, Emotional Appeal, Consistent Image, On-Line Completeness, Relative Advantage		
Wolfinbarger and Gilly (2003)		Web Site Design, Privacy/Security, Fulfilment/Reliability, Customer Service		
Parasuraman et al. (2005)		Efficiency, System Availability, Fulfilment, Privacy, Responsiveness, Compensation, Contact		

Fassnacht and Koese (2006)		Environment Quality	Graphic Quality, Clarity of Layout, Attractiveness of Selection	
		Delivery Quality	Information Quality, Ease of Use,	
		Outcome Quality	Technical Quality, Reliability, Functional Benefit, Emotional Benefit.	
Chae et al. (2002)	Mobile Service Quality	Connection Quality, Content Quality, Interaction Quality, Contextual Quality		
Tan and Chou (2008)		Perceived Usefulness, Perceived Ease of Use, Content, Variety, Feedback, Experimentation and Personalization		
Akter et al. (2016)	Service System Quality	System Quality,	System Reliability, System Efficiency, System Flexibility, System Privacy	
		Interaction Quality,	Responsiveness, Assurance, Empathy	
		Information Quality	Utilitarian, Hedonic	
Kim and Nitecki (2014)	Social Media Services Quality	Efficiency, System Availability, Privacy, Fulfilment		
Sousa and Voss (2006)		Virtual Fulfilment, Efficiency, Ease of Use, Speed, System Availability, Privacy		
Wixom and Todd (2005)	Integrated Model of System Quality and Information Quality in Website Context	System Quality	Reliability, Flexibility, Integration, Accessibility	Information satisfaction, System Satisfaction, Usefulness, Ease of Use, Attitude, Intention
		Information Quality	Completeness, Accuracy, Format, Currency	
Xu et al. (2013)	The 3Q Model (service quality, information quality and system quality) in	System Quality	Reliability, Flexibility, Integration, Accessibility, Timeliness	Information Satisfaction, System Satisfaction, Service Satisfaction, Usefulness, Ease of Use, Enjoyment, Attitude, Intention
		Information Quality	Reliability, Flexibility, Integration, Accessibility	
		Service Quality	Tangibles, Responsiveness, Empathy, Service Reliability, Assurance	

	Website Context			
Sousa and Voss (2006)	Integrated Multichannel in General Context	Channel-Service Configuration	Breadth of Channel Choice, Transparency of Channel-Service Configuration	N/A
		Integrated Interactions	Content Consistency, Process Consistency	
Banerjee (2014)	Integrated Multichannel Within Banking Service	Channel-Service Configuration	Breadth of Channel Choice, Transparency of Channel-Service Configuration, Appropriateness of Channel-Service Configuration,	N/A
		Integrated Interactions	Transaction Data and Interaction Data Integration, Process Consistency	
Seck and Philippe (2013)		Channel-Service Configuration, Integrated Interactions		Customer Satisfaction
Hsieh et al. (2012)		Information Consistency, Channel Accessibility, Personal Data Integration		Channel Switching Difficulties, And Satisfaction
Lee and Kim (2010)	Integrated Multichannel within Retailing Context	Information Consistency, Freedom in Channel Selection, E-Mail Marketing Effectiveness, Channel Reciprocity, Appreciation of Store-Based Customer Service		Loyalty Intention
Oh and Teo (2010)		Information Quality	Integrated Product and Pricing Information, Integrated Transaction Information, Integrated Promotion Information	Customer Value
		Service Convenience	Integrated Information Access, Integrated Customer Service, Integrated Order Fulfillment	
Oh et al. (2012)		Integrated Product and Pricing Management, Integrated Transaction Information Management, Integrated Promotion, Integrated Information Access, Integrated Customer Service, Integrated Order Fulfillment		Exploitative Competence, Explorative Competence, Firm Performance
Saeed et al. (2003)		Informational Integration; Content Integration; Logistical Integration		
Wu and Chang (2016)		Transparency of service configuration, Information consistency, Business ties, Process consistency		Online purchase intention, Online monetary savings, Online hedonic value

Van Baal (2014)		Harmonisation		Cross channel customer retention, cannibalisation,
Emrich et al. (2015)		Channel Integration (Full, Asymmetrical, None)		Perceived Variety, Perceived Risk, Perceived Convenience, Patronage Intentions
Madaleno et al. (2007)	Multichannel B2B	Cross Channel Consistency, Channel Choice		Customer Satisfaction
Pantano and Viassone (2015)	Single Channel Quality in Multichannel Retailing Context	Store atmosphere, Channel availability		Satisfaction, Attitude, Purchase Intention
Bapat and Bapat (2017)		N/A		Satisfaction, Loyalty
White et al. (2013)		Design factors, Ambient Factors, Social Factors		Retailer Brand Equity
Yu et al. (2011)		Perceived Channel Quality	Perceived Service Quality, Perceived Merchandise Quality,	Channel Usage Intention (Information search, Multichannel shopping)
		Perceived Channel Price	Perceived Monetary Price, Perceived Non-Monetary Price	
		Perceived Channel Value	Perceived Hedonic Value, Perceived Utilitarian Value	
Hammerschmidt et al. (2015)		Choice, Charge, Convenience, Confidence, Care,		Overall Satisfaction
Li et al. (2018)	Channel Integration within Omnichannel Retailing Context	Channel-Service Configuration	Breadth of channel service choice, Transparency of channel-service configuration	Customer Engagement, Repurchase Intention, Positive Word-of-Mouth
		Integrated Interactions	Content consistency, Process consistency	
Lee et al. (2018)		Channel integration		Customer retention, interest in Alternatives, Retailer Uncertainty, Identity Attractiveness, Switching Cost
Shen et al. (2018)		Service Configuration Quality	Channel Choice Breadth, Channel Service Transparency	Channel Usage Intentions

Appendix 5: Cross-loading Matrix

	APPROPRIATENESS OF CHANNEL	ASSURANCE QUALITY	BRAND EQUITY	BREADTH OF CHANNEL	CHANNEL SERVICE CONFIGURATION	CONTENT CONSISTENCY	CUSTOMER EQUITY	IMAGE CONSISTENCY	INFORMATION CONSISTENCY	MCIQ	MULTICHANNEL SATISFACTION	PRIVACY	PROCESS CONSISTENCY	RELATIONSHIP EQUITY	SECURITY	SERVICE RECOVERY ACCESSIBILITY	SYSTEM CONSISTENCY	TRANSACTION DATA INTEGRATION	TRANSPARENCY OF CHANNEL	VALUE EQUITY
APRC_1	0.909	0.565	0.286	0.483	0.766	0.683	0.431	0.462	0.549	0.768	0.568	0.439	0.605	0.113	0.462	0.506	0.598	0.592	0.527	0.425
APRC_1	0.909	0.565	0.286	0.483	0.766	0.683	0.431	0.462	0.549	0.768	0.568	0.439	0.605	0.113	0.462	0.506	0.598	0.592	0.527	0.425
APRC_1	0.909	0.565	0.286	0.483	0.766	0.683	0.431	0.462	0.549	0.768	0.568	0.439	0.605	0.113	0.462	0.506	0.598	0.592	0.527	0.425
APRC_2	0.863	0.503	0.398	0.338	0.632	0.478	0.453	0.322	0.360	0.612	0.505	0.377	0.441	0.102	0.392	0.492	0.453	0.438	0.400	0.352
APRC_2	0.863	0.503	0.398	0.338	0.632	0.478	0.453	0.322	0.360	0.612	0.505	0.377	0.441	0.102	0.392	0.492	0.453	0.438	0.400	0.352
APRC_2	0.863	0.503	0.398	0.338	0.632	0.478	0.453	0.322	0.360	0.612	0.505	0.377	0.441	0.102	0.392	0.492	0.453	0.438	0.400	0.352
BRDC_1	0.386	0.302	0.166	0.836	0.689	0.389	0.287	0.280	0.273	0.492	0.310	0.242	0.379	0.099	0.245	0.259	0.385	0.378	0.405	0.302
BRDC_1	0.386	0.302	0.166	0.836	0.689	0.389	0.287	0.280	0.273	0.492	0.310	0.242	0.379	0.099	0.245	0.259	0.385	0.378	0.405	0.302
BRDC_1	0.386	0.302	0.166	0.836	0.689	0.389	0.287	0.280	0.273	0.492	0.310	0.242	0.379	0.099	0.245	0.259	0.385	0.378	0.405	0.302
BRDC_2	0.436	0.397	0.223	0.874	0.751	0.519	0.340	0.357	0.450	0.601	0.459	0.268	0.440	0.152	0.386	0.365	0.414	0.414	0.465	0.324
BRDC_2	0.436	0.397	0.223	0.874	0.751	0.519	0.340	0.357	0.450	0.601	0.459	0.268	0.440	0.152	0.386	0.365	0.414	0.414	0.465	0.324
BRDC_2	0.436	0.397	0.223	0.874	0.751	0.519	0.340	0.357	0.450	0.601	0.459	0.268	0.440	0.152	0.386	0.365	0.414	0.414	0.465	0.324

BRDC_3	0.353	0.215	0.173	0.798	0.653	0.368	0.278	0.285	0.254	0.429	0.234	0.147	0.327	0.084	0.149	0.251	0.287	0.361	0.394	0.284
BRDC_3	0.353	0.215	0.173	0.798	0.653	0.368	0.278	0.285	0.254	0.429	0.234	0.147	0.327	0.084	0.149	0.251	0.287	0.361	0.394	0.284
BRDC_3	0.353	0.215	0.173	0.798	0.653	0.368	0.278	0.285	0.254	0.429	0.234	0.147	0.327	0.084	0.149	0.251	0.287	0.361	0.394	0.284
BRNE_2	0.353	0.462	0.901	0.195	0.314	0.382	0.762	0.316	0.366	0.467	0.484	0.442	0.391	0.036	0.348	0.302	0.366	0.269	0.238	0.387
BRNE_2	0.353	0.462	0.901	0.195	0.314	0.382	0.762	0.316	0.366	0.467	0.484	0.442	0.391	0.036	0.348	0.302	0.366	0.269	0.238	0.387
BRNE_3	0.254	0.351	0.830	0.150	0.243	0.232	0.656	0.245	0.248	0.341	0.314	0.304	0.301	0.047	0.226	0.323	0.282	0.138	0.205	0.282
BRNE_3	0.254	0.351	0.830	0.150	0.243	0.232	0.656	0.245	0.248	0.341	0.314	0.304	0.301	0.047	0.226	0.323	0.282	0.138	0.205	0.282
BRNE_4	0.382	0.507	0.900	0.243	0.361	0.396	0.763	0.290	0.365	0.495	0.486	0.445	0.366	0.091	0.372	0.409	0.350	0.295	0.274	0.378
BRNE_4	0.382	0.507	0.900	0.243	0.361	0.396	0.763	0.290	0.365	0.495	0.486	0.445	0.366	0.091	0.372	0.409	0.350	0.295	0.274	0.378
IMGC_1	0.393	0.384	0.260	0.310	0.410	0.457	0.334	0.829	0.324	0.559	0.380	0.295	0.717	-0.116	0.343	0.322	0.407	0.440	0.310	0.333
IMGC_1	0.393	0.384	0.260	0.310	0.410	0.457	0.334	0.829	0.324	0.559	0.380	0.295	0.717	-0.116	0.343	0.322	0.407	0.440	0.310	0.333
IMGC_1	0.393	0.384	0.260	0.310	0.410	0.457	0.334	0.829	0.324	0.559	0.380	0.295	0.717	-0.116	0.343	0.322	0.407	0.440	0.310	0.333
IMGC_2	0.378	0.410	0.269	0.330	0.434	0.494	0.341	0.901	0.404	0.610	0.499	0.304	0.807	0.015	0.366	0.361	0.493	0.421	0.362	0.310
IMGC_2	0.378	0.410	0.269	0.330	0.434	0.494	0.341	0.901	0.404	0.610	0.499	0.304	0.807	0.015	0.366	0.361	0.493	0.421	0.362	0.310
IMGC_2	0.378	0.410	0.269	0.330	0.434	0.494	0.341	0.901	0.404	0.610	0.499	0.304	0.807	0.015	0.366	0.361	0.493	0.421	0.362	0.310
IMGC_3	0.425	0.468	0.334	0.342	0.458	0.533	0.408	0.929	0.395	0.654	0.534	0.361	0.823	-0.045	0.419	0.389	0.491	0.496	0.365	0.370
IMGC_3	0.425	0.468	0.334	0.342	0.458	0.533	0.408	0.929	0.395	0.654	0.534	0.361	0.823	-0.045	0.419	0.389	0.491	0.496	0.365	0.370
IMGC_3	0.425	0.468	0.334	0.342	0.458	0.533	0.408	0.929	0.395	0.654	0.534	0.361	0.823	-0.045	0.419	0.389	0.491	0.496	0.365	0.370
INFC_1	0.528	0.475	0.382	0.385	0.527	0.746	0.443	0.444	0.837	0.676	0.571	0.360	0.538	0.082	0.418	0.411	0.497	0.395	0.393	0.354
INFC_1	0.528	0.475	0.382	0.385	0.527	0.746	0.443	0.444	0.837	0.676	0.571	0.360	0.538	0.082	0.418	0.411	0.497	0.395	0.393	0.354
INFC_1	0.528	0.475	0.382	0.385	0.527	0.746	0.443	0.444	0.837	0.676	0.571	0.360	0.538	0.082	0.418	0.411	0.497	0.395	0.393	0.354
INFC_2	0.382	0.381	0.285	0.277	0.380	0.697	0.352	0.325	0.867	0.553	0.451	0.283	0.397	0.079	0.310	0.365	0.369	0.286	0.280	0.298
INFC_2	0.382	0.381	0.285	0.277	0.380	0.697	0.352	0.325	0.867	0.553	0.451	0.283	0.397	0.079	0.310	0.365	0.369	0.286	0.280	0.298
INFC_2	0.382	0.381	0.285	0.277	0.380	0.697	0.352	0.325	0.867	0.553	0.451	0.283	0.397	0.079	0.310	0.365	0.369	0.286	0.280	0.298
INFC_3	0.399	0.454	0.329	0.297	0.408	0.713	0.413	0.305	0.864	0.594	0.475	0.331	0.400	0.116	0.425	0.392	0.398	0.316	0.314	0.351

INFC_3	0.399	0.454	0.329	0.297	0.408	0.713	0.413	0.305	0.864	0.594	0.475	0.331	0.400	0.116	0.425	0.392	0.398	0.316	0.314	0.351
INFC_3	0.399	0.454	0.329	0.297	0.408	0.713	0.413	0.305	0.864	0.594	0.475	0.331	0.400	0.116	0.425	0.392	0.398	0.316	0.314	0.351
INFC_4	0.494	0.499	0.303	0.402	0.527	0.762	0.397	0.391	0.900	0.674	0.541	0.372	0.477	0.111	0.462	0.419	0.443	0.359	0.403	0.350
INFC_4	0.494	0.499	0.303	0.402	0.527	0.762	0.397	0.391	0.900	0.674	0.541	0.372	0.477	0.111	0.462	0.419	0.443	0.359	0.403	0.350
INFC_4	0.494	0.499	0.303	0.402	0.527	0.762	0.397	0.391	0.900	0.674	0.541	0.372	0.477	0.111	0.462	0.419	0.443	0.359	0.403	0.350
MSAT_1	0.575	0.672	0.523	0.382	0.541	0.601	0.664	0.503	0.550	0.728	0.910	0.508	0.613	0.199	0.627	0.551	0.569	0.449	0.387	0.568
MSAT_2	0.582	0.624	0.448	0.387	0.554	0.639	0.607	0.529	0.567	0.725	0.949	0.461	0.615	0.120	0.585	0.526	0.545	0.497	0.406	0.561
MSAT_3	0.526	0.586	0.393	0.358	0.505	0.569	0.549	0.423	0.508	0.657	0.905	0.438	0.533	0.174	0.537	0.499	0.511	0.439	0.370	0.506
MSAT_4	0.555	0.604	0.447	0.367	0.543	0.629	0.593	0.510	0.545	0.713	0.924	0.435	0.619	0.071	0.591	0.506	0.572	0.503	0.428	0.549
PRIV_1	0.488	0.839	0.399	0.286	0.452	0.485	0.463	0.378	0.417	0.697	0.490	0.843	0.490	0.098	0.653	0.459	0.480	0.391	0.355	0.369
PRIV_1	0.488	0.839	0.399	0.286	0.452	0.485	0.463	0.378	0.417	0.697	0.490	0.843	0.490	0.098	0.653	0.459	0.480	0.391	0.355	0.369
PRIV_1	0.488	0.839	0.399	0.286	0.452	0.485	0.463	0.378	0.417	0.697	0.490	0.843	0.490	0.098	0.653	0.459	0.480	0.391	0.355	0.369
PRIV_2	0.385	0.817	0.440	0.230	0.356	0.396	0.480	0.330	0.367	0.619	0.459	0.926	0.429	0.053	0.592	0.317	0.422	0.291	0.273	0.367
PRIV_2	0.385	0.817	0.440	0.230	0.356	0.396	0.480	0.330	0.367	0.619	0.459	0.926	0.429	0.053	0.592	0.317	0.422	0.291	0.273	0.367
PRIV_2	0.385	0.817	0.440	0.230	0.356	0.396	0.480	0.330	0.367	0.619	0.459	0.926	0.429	0.053	0.592	0.317	0.422	0.291	0.273	0.367
PRIV_3	0.390	0.778	0.420	0.217	0.328	0.334	0.481	0.288	0.297	0.569	0.430	0.907	0.391	0.075	0.577	0.250	0.399	0.260	0.213	0.385
PRIV_3	0.390	0.778	0.420	0.217	0.328	0.334	0.481	0.288	0.297	0.569	0.430	0.907	0.391	0.075	0.577	0.250	0.399	0.260	0.213	0.385
PRIV_3	0.390	0.778	0.420	0.217	0.328	0.334	0.481	0.288	0.297	0.569	0.430	0.907	0.391	0.075	0.577	0.250	0.399	0.260	0.213	0.385
RECO_1	0.499	0.554	0.293	0.343	0.477	0.439	0.388	0.386	0.401	0.581	0.465	0.309	0.442	0.212	0.333	0.818	0.385	0.329	0.342	0.324
RECO_1	0.499	0.554	0.293	0.343	0.477	0.439	0.388	0.386	0.401	0.581	0.465	0.309	0.442	0.212	0.333	0.818	0.385	0.329	0.342	0.324
RECO_1	0.499	0.554	0.293	0.343	0.477	0.439	0.388	0.386	0.401	0.581	0.465	0.309	0.442	0.212	0.333	0.818	0.385	0.329	0.342	0.324
RECO_2	0.453	0.593	0.367	0.294	0.418	0.414	0.423	0.337	0.336	0.567	0.471	0.333	0.417	0.192	0.330	0.899	0.392	0.355	0.293	0.313
RECO_2	0.453	0.593	0.367	0.294	0.418	0.414	0.423	0.337	0.336	0.567	0.471	0.333	0.417	0.192	0.330	0.899	0.392	0.355	0.293	0.313
RECO_2	0.453	0.593	0.367	0.294	0.418	0.414	0.423	0.337	0.336	0.567	0.471	0.333	0.417	0.192	0.330	0.899	0.392	0.355	0.293	0.313
RECO_4	0.523	0.622	0.367	0.289	0.463	0.486	0.460	0.340	0.462	0.620	0.543	0.333	0.441	0.281	0.413	0.903	0.432	0.346	0.347	0.360

RECO_4	0.523	0.622	0.367	0.289	0.463	0.486	0.460	0.340	0.462	0.620	0.543	0.333	0.441	0.281	0.413	0.903	0.432	0.346	0.347	0.360
RECO_4	0.523	0.622	0.367	0.289	0.463	0.486	0.460	0.340	0.462	0.620	0.543	0.333	0.441	0.281	0.413	0.903	0.432	0.346	0.347	0.360
RELE_2	0.115	0.175	0.034	0.147	0.146	0.142	0.162	-0.002	0.149	0.166	0.148	0.086	0.069	0.865	0.126	0.257	0.127	0.087	0.089	0.059
RELE_2	0.115	0.175	0.034	0.147	0.146	0.142	0.162	-0.002	0.149	0.166	0.148	0.086	0.069	0.865	0.126	0.257	0.127	0.087	0.089	0.059
RELE_3	0.105	0.174	0.079	0.103	0.119	0.065	0.216	-0.080	0.064	0.124	0.130	0.102	0.018	0.927	0.135	0.221	0.118	0.044	0.082	0.100
RELE_3	0.105	0.174	0.079	0.103	0.119	0.065	0.216	-0.080	0.064	0.124	0.130	0.102	0.018	0.927	0.135	0.221	0.118	0.044	0.082	0.100
SECU_1	0.422	0.797	0.347	0.276	0.398	0.466	0.497	0.397	0.443	0.663	0.597	0.643	0.489	0.154	0.961	0.375	0.459	0.332	0.289	0.469
SECU_1	0.422	0.797	0.347	0.276	0.398	0.466	0.497	0.397	0.443	0.663	0.597	0.643	0.489	0.154	0.961	0.375	0.459	0.332	0.289	0.469
SECU_1	0.422	0.797	0.347	0.276	0.398	0.466	0.497	0.397	0.443	0.663	0.597	0.643	0.489	0.154	0.961	0.375	0.459	0.332	0.289	0.469
SECU_2	0.509	0.806	0.352	0.333	0.488	0.511	0.511	0.419	0.456	0.712	0.625	0.635	0.522	0.127	0.962	0.416	0.494	0.396	0.371	0.492
SECU_2	0.509	0.806	0.352	0.333	0.488	0.511	0.511	0.419	0.456	0.712	0.625	0.635	0.522	0.127	0.962	0.416	0.494	0.396	0.371	0.492
SECU_2	0.509	0.806	0.352	0.333	0.488	0.511	0.511	0.419	0.456	0.712	0.625	0.635	0.522	0.127	0.962	0.416	0.494	0.396	0.371	0.492
SYSC_1	0.377	0.364	0.195	0.330	0.422	0.445	0.339	0.406	0.309	0.534	0.337	0.320	0.641	0.060	0.300	0.262	0.731	0.437	0.333	0.371
SYSC_1	0.377	0.364	0.195	0.330	0.422	0.445	0.339	0.406	0.309	0.534	0.337	0.320	0.641	0.060	0.300	0.262	0.731	0.437	0.333	0.371
SYSC_1	0.377	0.364	0.195	0.330	0.422	0.445	0.339	0.406	0.309	0.534	0.337	0.320	0.641	0.060	0.300	0.262	0.731	0.437	0.333	0.371
SYSC_2	0.538	0.531	0.327	0.379	0.576	0.568	0.474	0.459	0.433	0.712	0.571	0.412	0.766	0.153	0.486	0.427	0.894	0.515	0.517	0.450
SYSC_2	0.538	0.531	0.327	0.379	0.576	0.568	0.474	0.459	0.433	0.712	0.571	0.412	0.766	0.153	0.486	0.427	0.894	0.515	0.517	0.450
SYSC_2	0.538	0.531	0.327	0.379	0.576	0.568	0.474	0.459	0.433	0.712	0.571	0.412	0.766	0.153	0.486	0.427	0.894	0.515	0.517	0.450
SYSC_3	0.575	0.553	0.419	0.381	0.595	0.579	0.523	0.449	0.484	0.726	0.568	0.460	0.750	0.119	0.443	0.453	0.873	0.482	0.528	0.448
SYSC_3	0.575	0.553	0.419	0.381	0.595	0.579	0.523	0.449	0.484	0.726	0.568	0.460	0.750	0.119	0.443	0.453	0.873	0.482	0.528	0.448
SYSC_3	0.575	0.553	0.419	0.381	0.595	0.579	0.523	0.449	0.484	0.726	0.568	0.460	0.750	0.119	0.443	0.453	0.873	0.482	0.528	0.448
TRDI_1	0.504	0.412	0.239	0.374	0.501	0.720	0.369	0.415	0.364	0.625	0.462	0.344	0.514	0.031	0.370	0.298	0.486	0.848	0.362	0.381
TRDI_1	0.504	0.412	0.239	0.374	0.501	0.720	0.369	0.415	0.364	0.625	0.462	0.344	0.514	0.031	0.370	0.298	0.486	0.848	0.362	0.381
TRDI_1	0.504	0.412	0.239	0.374	0.501	0.720	0.369	0.415	0.364	0.625	0.462	0.344	0.514	0.031	0.370	0.298	0.486	0.848	0.362	0.381
TRDI_2	0.465	0.406	0.225	0.404	0.514	0.719	0.377	0.434	0.358	0.625	0.420	0.317	0.514	0.063	0.355	0.337	0.464	0.853	0.397	0.404

TRDI_2	0.465	0.406	0.225	0.404	0.514	0.719	0.377	0.434	0.358	0.625	0.420	0.317	0.514	0.063	0.355	0.337	0.464	0.853	0.397	0.404
TRDI_2	0.465	0.406	0.225	0.404	0.514	0.719	0.377	0.434	0.358	0.625	0.420	0.317	0.514	0.063	0.355	0.337	0.464	0.853	0.397	0.404
TRDI_3	0.541	0.385	0.213	0.460	0.605	0.723	0.409	0.446	0.343	0.655	0.450	0.276	0.561	0.082	0.341	0.358	0.537	0.875	0.491	0.466
TRDI_3	0.541	0.385	0.213	0.460	0.605	0.723	0.409	0.446	0.343	0.655	0.450	0.276	0.561	0.082	0.341	0.358	0.537	0.875	0.491	0.466
TRDI_3	0.541	0.385	0.213	0.460	0.605	0.723	0.409	0.446	0.343	0.655	0.450	0.276	0.561	0.082	0.341	0.358	0.537	0.875	0.491	0.466
TRDI_4	0.486	0.298	0.247	0.316	0.479	0.638	0.311	0.436	0.259	0.553	0.405	0.206	0.510	0.059	0.208	0.343	0.454	0.819	0.391	0.271
TRDI_4	0.486	0.298	0.247	0.316	0.479	0.638	0.311	0.436	0.259	0.553	0.405	0.206	0.510	0.059	0.208	0.343	0.454	0.819	0.391	0.271
TRDI_4	0.486	0.298	0.247	0.316	0.479	0.638	0.311	0.436	0.259	0.553	0.405	0.206	0.510	0.059	0.208	0.343	0.454	0.819	0.391	0.271
TRNC_1	0.469	0.365	0.271	0.442	0.734	0.466	0.379	0.362	0.380	0.581	0.374	0.274	0.482	0.076	0.304	0.338	0.483	0.397	0.916	0.360
TRNC_1	0.469	0.365	0.271	0.442	0.734	0.466	0.379	0.362	0.380	0.581	0.374	0.274	0.482	0.076	0.304	0.338	0.483	0.397	0.916	0.360
TRNC_1	0.469	0.365	0.271	0.442	0.734	0.466	0.379	0.362	0.380	0.581	0.374	0.274	0.482	0.076	0.304	0.338	0.483	0.397	0.916	0.360
TRNC_2	0.504	0.377	0.233	0.486	0.771	0.510	0.392	0.357	0.362	0.616	0.419	0.274	0.509	0.096	0.328	0.351	0.538	0.491	0.924	0.415
TRNC_2	0.504	0.377	0.233	0.486	0.771	0.510	0.392	0.357	0.362	0.616	0.419	0.274	0.509	0.096	0.328	0.351	0.538	0.491	0.924	0.415
TRNC_2	0.504	0.377	0.233	0.486	0.771	0.510	0.392	0.357	0.362	0.616	0.419	0.274	0.509	0.096	0.328	0.351	0.538	0.491	0.924	0.415
VALE_1	0.362	0.401	0.288	0.318	0.427	0.449	0.696	0.308	0.325	0.508	0.491	0.305	0.457	0.063	0.400	0.303	0.496	0.427	0.375	0.889
VALE_1	0.362	0.401	0.288	0.318	0.427	0.449	0.696	0.308	0.325	0.508	0.491	0.305	0.457	0.063	0.400	0.303	0.496	0.427	0.375	0.889
VALE_2	0.336	0.485	0.413	0.227	0.345	0.381	0.726	0.293	0.379	0.475	0.524	0.388	0.359	0.139	0.463	0.353	0.335	0.254	0.295	0.799
VALE_2	0.336	0.485	0.413	0.227	0.345	0.381	0.726	0.293	0.379	0.475	0.524	0.388	0.359	0.139	0.463	0.353	0.335	0.254	0.295	0.799
VALE_3	0.430	0.422	0.318	0.385	0.497	0.458	0.697	0.370	0.291	0.541	0.498	0.329	0.479	0.029	0.411	0.314	0.469	0.477	0.409	0.866
VALE_3	0.430	0.422	0.318	0.385	0.497	0.458	0.697	0.370	0.291	0.541	0.498	0.329	0.479	0.029	0.411	0.314	0.469	0.477	0.409	0.866